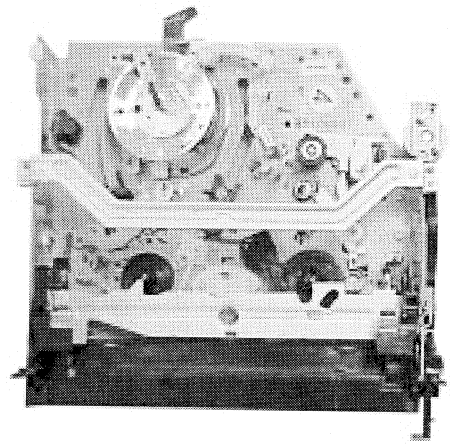
aiwa
SERVICE

NC3600 P4LRH English



SERVICE MANUAL

VIDEO MECHANISM

aiwa

S/M Code No. 09-995-333-1N1

VCR TEST TAPE INTERCHANGEABILITY TABLE

There are two types of the new allgnment tape CH-1B (for NTSC) and CH-2 (for PAL). On each tape four signals (1)-(4) are recorded for the times and in the order shown below.

(1) : 8min. fi (2) : 2min. fi (3) : 5min. fi (4) : 5min.

The TTV-MP1 (for M-PAL), TTV-MS1 (for MESECAM) and TTV-S1 (for SECAM) allgnment tapes have the same contents as the previous tapes.

Method	Now in use TYPE		New TYPE		Application
	Model	Contents *1	Model	Contents *1	
NTSC	TTV-N1	NTSC, Color bar, 1kHz, SP	CH-1B(2)	NTSC, Stairsteps, 1kHz, SP	PB-Y Level/General electrical ADJ. Head ACE Height/Tilt ADJ.
	TTV-NS1	NTSC, Color bar, 1kHz, SP	No Changed.		For S-VHS (SQPB) check
	TTV-N1E	NTSC, Color bar, 1kHz, EP	CH-1B(4) *2	NTSC, Color bar, 1kHz, EP	Switching position ADJ.
	TTV-NS6E	NTSC, Color bar, No sound, EP	No Changed.		For S-VHS (SQPB) check
	TTV-N2	NTSC, Stairsteps, 7kHz, SP	CH-1B(1)	NTSC, Stairsteps, 7kHz, SP	Head ACE Azimuth ADJ.
	TTV-N12 (SCV-1998)	NTSC, Color bar, 1kHz, SP	CH-1B(4)	NTSC, Color bar, 1kHz, EP	FM Envelope ADJ. X-Value ADJ.
	TTV-N6 (TTV-N06T)	NTSC, Mono scope, 7kHz, SP	No Changed.		For total picture quality check (resolution, etc)
	TTV-N7A	NTSC, Stairsteps, 1kHz, SP, HiFi 400Hz	CH-1B(3)	NTSC, Color bar, No sound SP, HiFi 400Hz	HiFi Audio PB Level ADJ.
PAL	TTV-P1	PAL, Color bar, 1kHz, SP	CH-2(2) * 3	PAL, Stairsteps, 1kHz, SP	Switching position ADJ. PB-Y Level/General electrical ADJ. Head ACE Height/Tilt ADJ.
	TTV-P1L	PAL, Color bar, 1kHz, LP	CH-2(4)	PAL, Color bar, 1kHz, LP	Switching position. (LP Model) FM Envelope ADJ. (LP Model) X-Value ADJ. (LP Model)
	TTV-P2	PAL, Stairsteps, 6kHz, SP	CH-2(1)	PAL, Stairsteps, 6kHz, SP	HEAD ACE Azimuth ADJ. FM Envelope ADJ. (SP Model) X-Value ADJ. (SP Model)
	TTV-P6 (TTV-N06T)	PAL, Monoscope, 6kHz, SP	No Changed.		For total picture quality check (resolution, etc)
	TTV-P7	PAL, Stairsteps, 1kHz, SP, HiFi 1kHz	CH-2(3)	PAL, Color bar, No sound SP, HiFi400Hz	HiFi Audio PB Level ADJ.
	TTV-P16	PAL, Color bar, 400Hz, SP, HiFi 1kHz	No Changed.		FM Filter ADJ.

* 1. Described in the order of color format. video signal. linear audio. tape speed and Hi-Fi audio.
* 2. Use CH-1B (1)-(3) with models used exclusively in the SP mode.
* 3. Use CH-2 (3) and (4) when it is necessary to observe the chroma signal.

2. MECHANICAL ADJUSTMENT

2-1. LOCATION OF MECHANISM PARTS

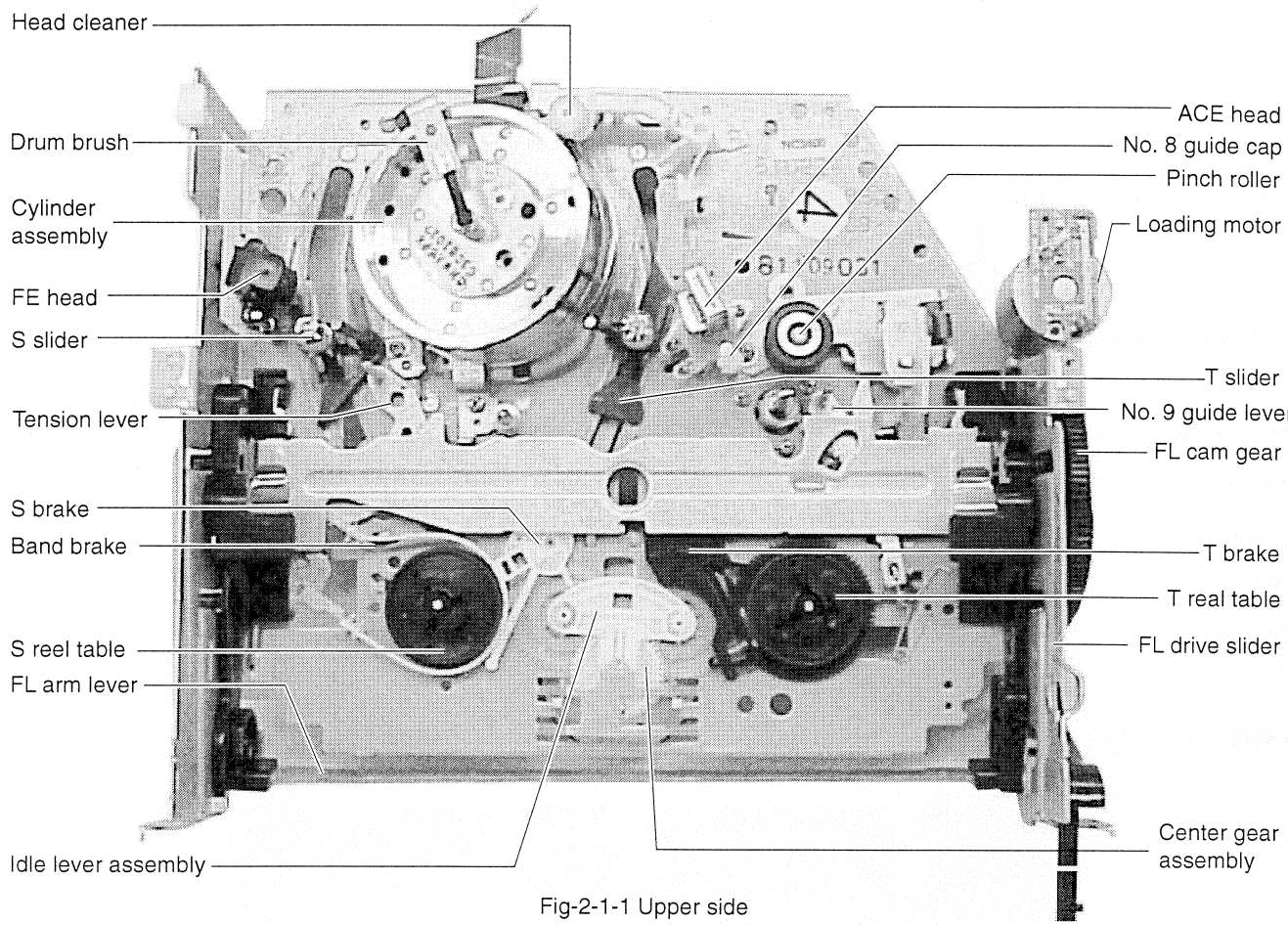


Fig-2-1-1 Upper side

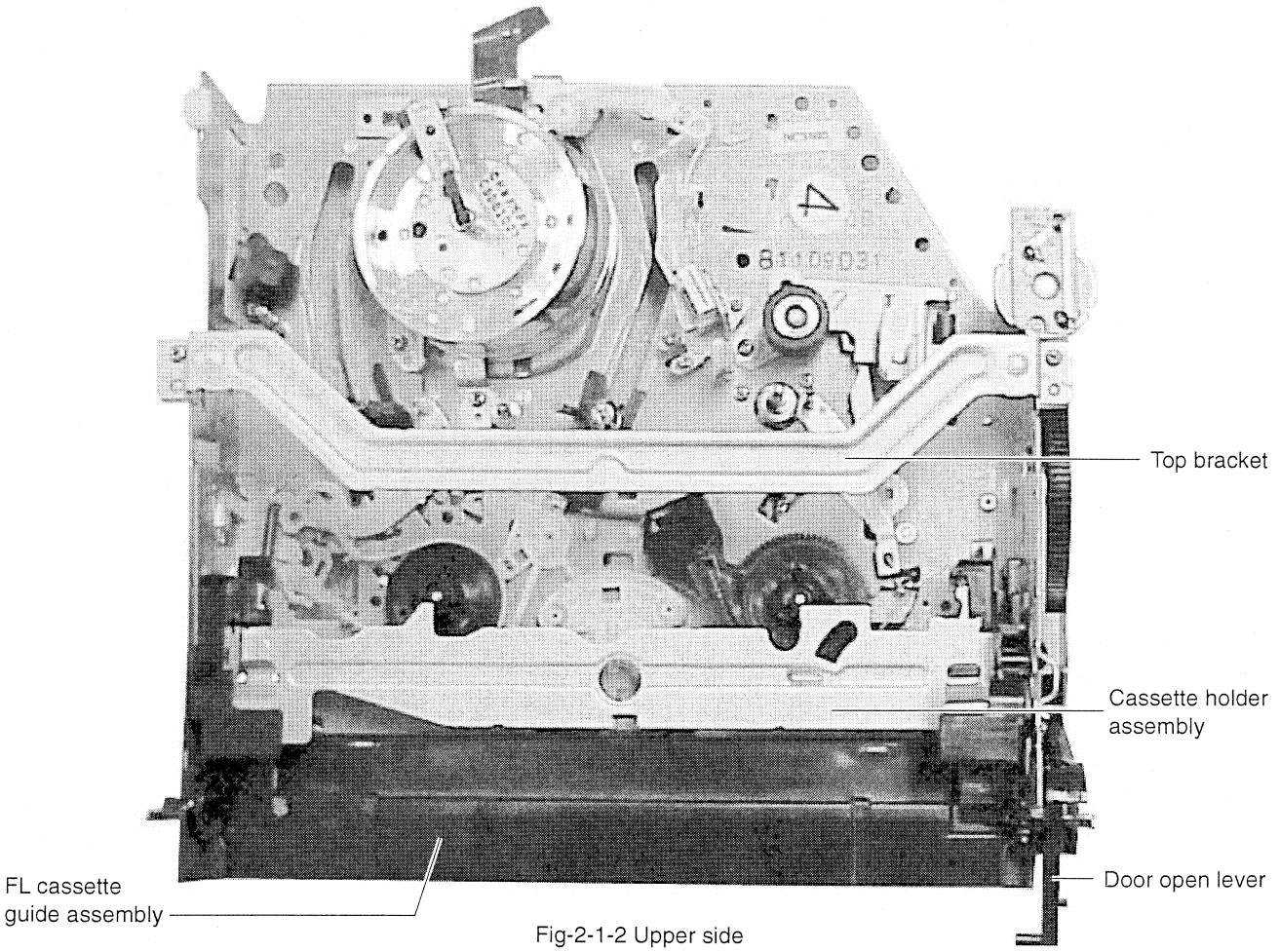


Fig-2-1-2 Upper side

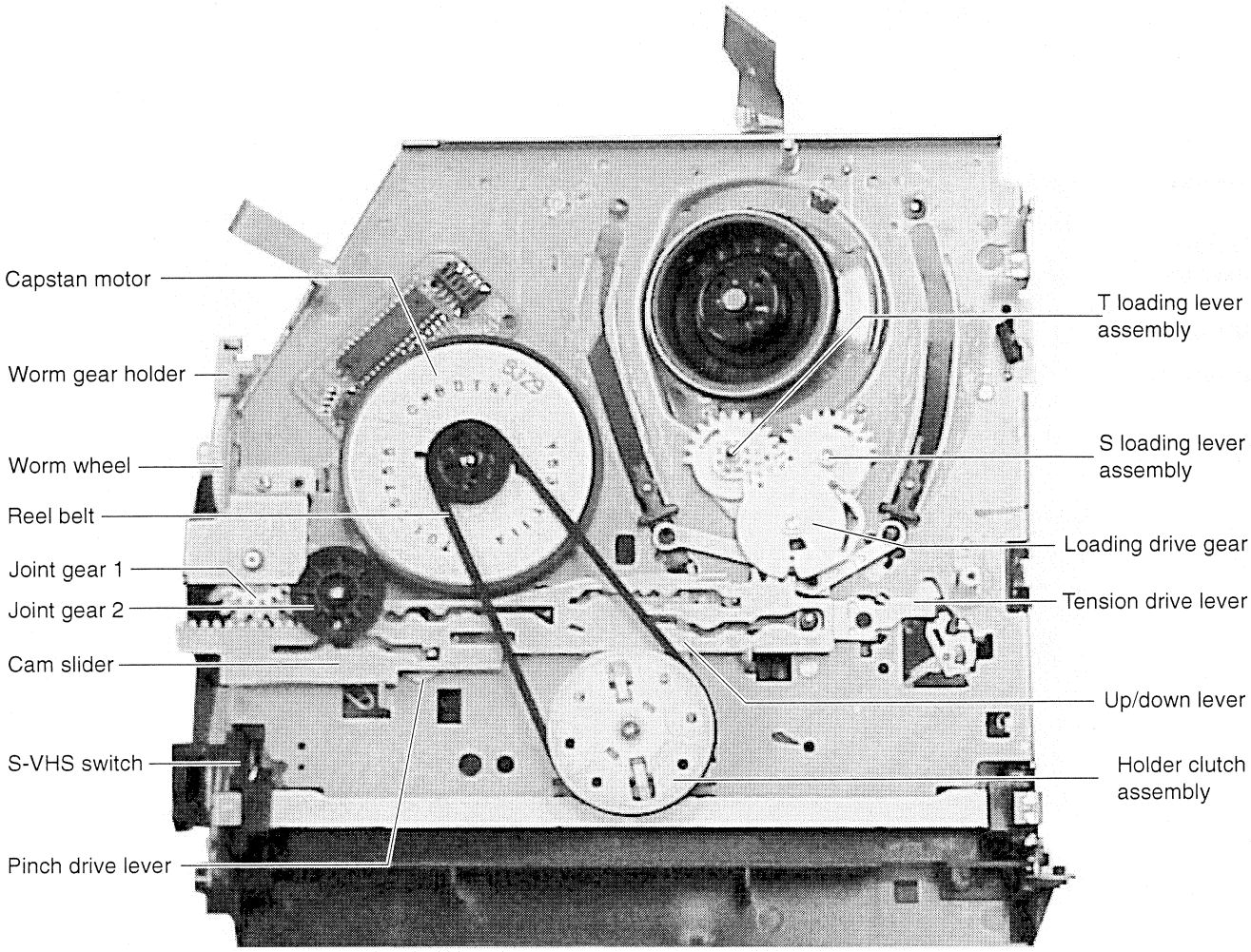
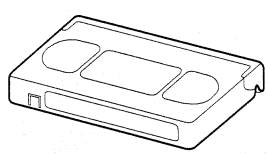
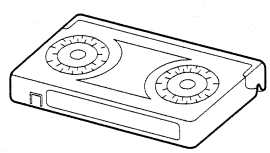
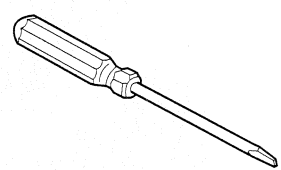


Fig-2-1-3 Rear side

2-2. SERVICE TOOL LIST

Alignment tape	Torque cassette (SRK-VHT-103-404)	Post height adjustment screwdriver (SV-TG0-030-000)
		

2-3. ALIGNMENT TAPES FOR ADJUSTMENT

Mechanism / Adjustment item		PAL SP/LP 2/4 head
FM envelope		TTV-P2L
A/C head	Slant	Commercially available tape
	Height	TTV-P1 (TTV-P1L)
	Azimuth	TTV-P2
X value		TTV-P2 (TTV-P2L)
RG post slant		Commercially available tape
Tape back-tension		SRK-VHT-103

2-4. GUIDELINE OF MAJOR PARTS REPLACEMENT

- The replacement periods that are shown below, indicate the guide line only, and are the life of the individual parts.
- The following guideline is compiled on the assumption the mechanism is used under the standard operating conditions (i.e., normal temperature and normal humidity.) The replacement periods change depending on the operating environments, method of use and running hours.
- Life of head assembly (cylinder) is especially heavily affected by the operating conditions.

Table 2-4-1

	Parts name	Guideline of time										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape run mechanism	Tension post											• Cleaning shall be performed using a cotton swab or cotton cloth moistened with alcohol. • After cleaning, wait until the cleaned parts are dried completely before using a video cassette tape. • Use the specified oil for lubrication. • When lubricating a part, apply only one or two drops of oil after cleaning the part with alcohol.
	S/T slant guide post											
	Impedance roller											
	Guide post No. 8	△	△	△	△	△	△	△	△	△	△	
	Capstan											
	Guide post No. 9											
	Guide post No. 3											
	S/T guide roller	△	△	△	○	○	○	○	○	○	○	
	Head assembly (cylinder)	△	○	○	○	○	○	○	○	○	○	
	FE head	△	△	△	○	○	○	○	○	○	○	
	ACE head	△	○	○	○	○	○	○	○	○	○	
	Pinch roller	△	○	○	○	○	○	○	○	○	○	
Drive mechanism	Capstan motor	△	△	△	△	△	○	○	○	○	○	
	Loading motor				○	○	○	○	○	○	○	
	Reel belt	△	○	○	○	○	○	○	○	○	○	
	Clutch gear assembly		○	○	○	○	○	○	○	○	○	
	Idle lever assembly		○	○	○	○	○	○	○	○	○	
Others	Band brake		○	○	○	○	○	○	○	○	○	
	Slip ring assembly		○	○	○	○	○	○	○	○	○	

△: Cleaning
○: Check the part. Replace when the part needs replacement.
*: Impedance roller is used in some models, but not used in some other models.

2-5. MECHANISM CHECK PROCEDURE

When a trouble is suspected to be caused by mechanism from the contents of the defect symptoms, follow the troubleshooting flow chart as shown, and locate the cause of trouble by the procedure as shown.

2-5-1. Outside Appearance Check

1) Check if there exists any foreign materials or not inside the VTR.
2) Check if the cylinder and the guides of the tape run mechanism are stained or not.

2-5-2. Checking Motor and Sensors

Check if motors and sensors (including the control circuit) have any abnormalities or not, by following the flow chart.

2-5-3. Trouble Analysis Using the Service Mode

This model has the service mode. The service mode provides the function to display the status when trouble occurs. Use the service mode to analyze cause of trouble.
Refer to the SERVICE MODE section of the manual for the procedure to display the data and for the contents of the service mode.

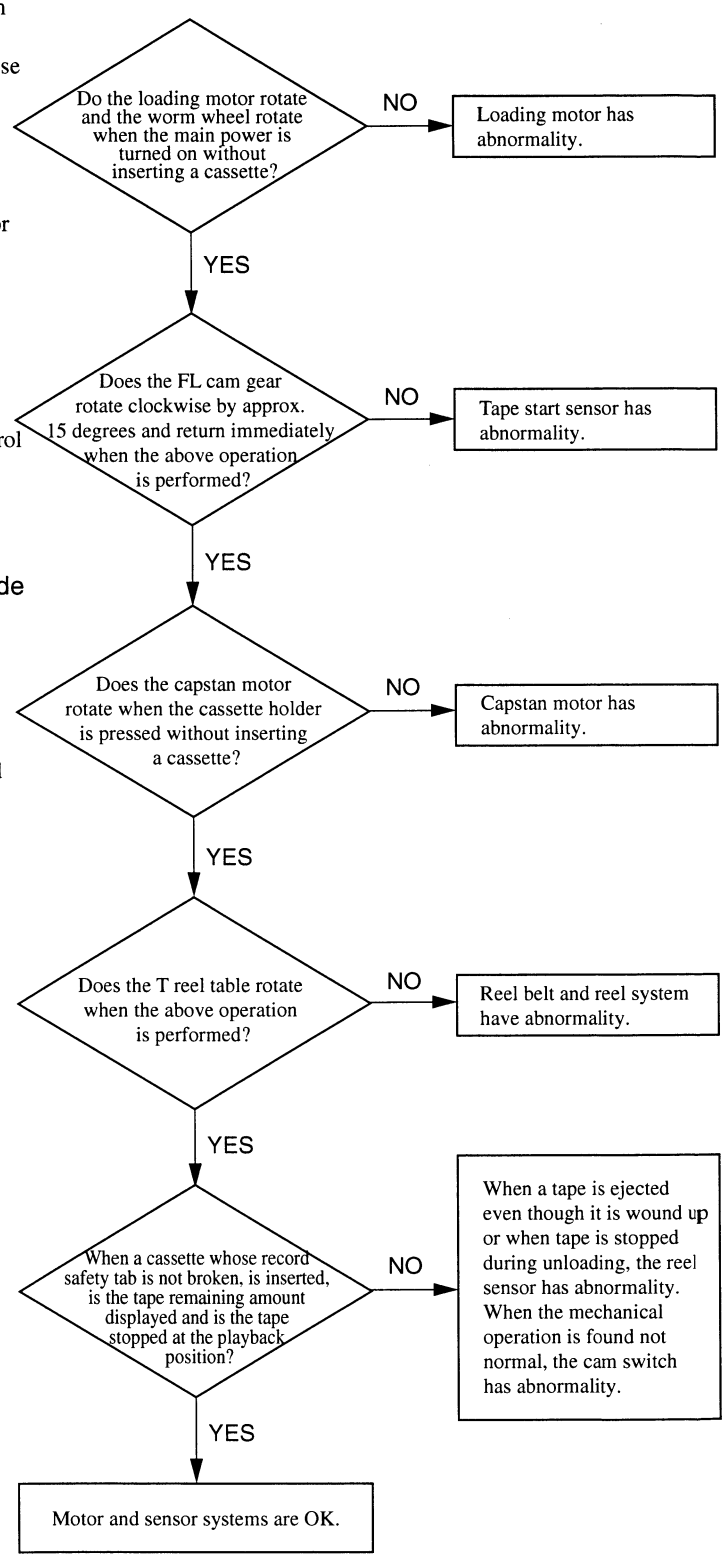

Do the loading motor rotate and the worm wheel rotate when the main power is turned on without inserting a cassette?
NO
Loading motor has abnormality.
YES
Does the FL cam gear rotate clockwise by approx. 15 degrees and return immediately when the above operation is performed?
NO
Tape start sensor has abnormality.
YES
Does the capstan motor rotate when the cassette holder is pressed without inserting a cassette?
NO
Capstan motor has abnormality.
YES
Does the T reel table rotate when the above operation is performed?
NO
Reel belt and reel system have abnormality.
YES
When a cassette whose record safety tab is not broken, is inserted, is the tape remaining amount displayed and is the tape stopped at the playback position?
NO
When a tape is ejected even though it is wound up or when tape is stopped during unloading, the reel sensor has abnormality. When the mechanical operation is found not normal, the cam switch has abnormality.
YES
Motor and sensor systems are OK.

Fig-2-5-1

2-5-4. HOW TO OPERATE THE MECHANISM (MODE TRANSITION) BY MANUAL OPERATION

1) Remove the worm gear holder using tweezers and remove the worm gear.

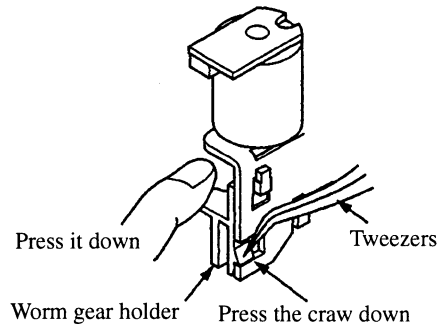


Fig-2-5-2

While pressing down the lock levers R and L of the cassette holder by hand, rotate the worm wheel in the clockwise direction. Then the mechanism can enter the loading modes by manual operation.
When the triangle (△) mark of the FL drive slider and the triangle (△) mark of the FL cam gear are aligned as shown in Fig-2-5-3, the mechanism can enter the following mechanism positions.

Power OFF	Stop 2
Review	Fast forward/Rewind 1
Play	Fast forward /Rewind 2
Stop 1	

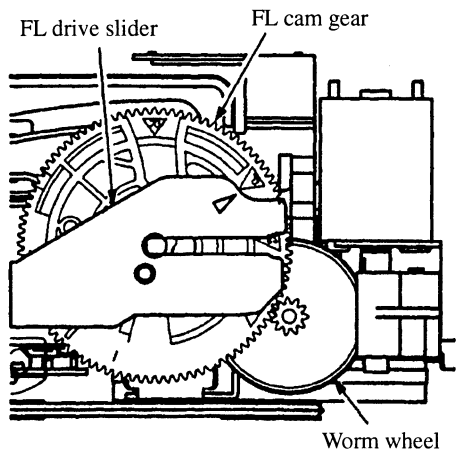


Fig-2-5-3 Position mark (Play position)

Move the mechanism to the status in which the trouble has occurred, by manual operation as shown above. Check status of the mechanism in the status in which the trouble has occurred.

Note: To check the Review, Stop 2, Fast forward/Rewind modes, rotate the mechanism I the unloading direction and stop the mechanism where the above described marks are aligned, and then check the mechanism.
There can be a case that the stop position of a mechanism by the cam switch and the position where marks are aligned, can be different due to play and variation of gear.
When you want to operate a mechanism after cassette holder is removed, be sure to press down the tension drive lever as shown in Fig-2-5-4 after the S and T sliders start moving and until the T slider comes to the AC head position.

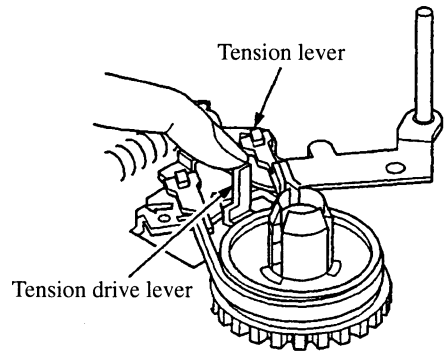


Fig-2-5-4

2) On replacement of the defective parts
When a specific part is found defective and needs to be replaced, note the following points.

- Pay special attention when replacing the mechanical parts that need phase adjustment.
  Pay special attention for the parts installation mode and phase-alignment marks, and others.
- For the parts that need greasing and lubrication, coat the parts with proper amount of grease or oil as specified to the specific point. Be careful so that grease or oil must not splashed to any other parts. After greasing or lubrication, install the mechanism into the product, turn on the main power and confirm proper operation of the mechanism.

3) Confirmation after repair work is completed.
When the repair work is completed (especially when replacement and/or adjustment of mechanical parts are performed), be sure to confirm operation and movement of mechanical parts and mechanism before installing the mechanism back into the machine. Then turn on the main power and operate the machine to confirm the correct operation of the machine.

Note: When any repair work is performed and mechanical parts are replaced in order to solve the trouble of "Mechanical parts are broken or phase-adjustment", and when the same (or similar) trouble occurs during the operation check after the main power is turned on, the main cause (mechanical or electrical circuit) of the trouble may exist in other locations. Please check the other assemblies and blocks too.

2-5-5. How To Eject A Videocassette Manually

Because one of the screws that fix the mechanism deck to the chassis, is located beneath the cassette, the mechanism deck cannot be removed while a videocassette exists inside the mechanism deck. If a videocassette cannot be ejected even though the EJECT button is pressed, remove the videocassette by the following procedure.

1) Remove the work gear holder and the worm gear by referring to section 2-6-6. Rotate the worm wheel in the direction of the arrow (unloading direction, Fig-2-5-5) with a screwdriver.
2) When the S and T sliders start unloading, insert a precision (watch) screwdriver into the long slot on the bottom panel as shown in Fig-2-5-6 so that the loosened tape must not get oily or must not get greasy. Using the precision (watch) screwdriver, rotate the pulley of the clutch gear assembly in the direction of the arrow when viewed from the bottom. Rotate the worm wheel to take up the tape onto a reel table.

Note:
- Stand the machine in the upright position when removing a videocassette manually as shown in Fig-2-5-6 and as described in this section in order to protect a tape.
- If a mechanism is locked and if a videocassette cannot be ejected when through the worm wheel is rotated, remove by breaking the cassette retainer block as shown in Fig-2-5-7.

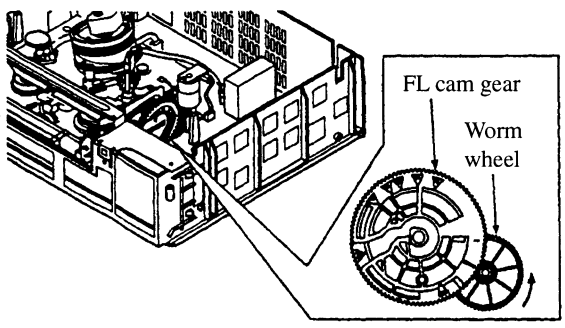
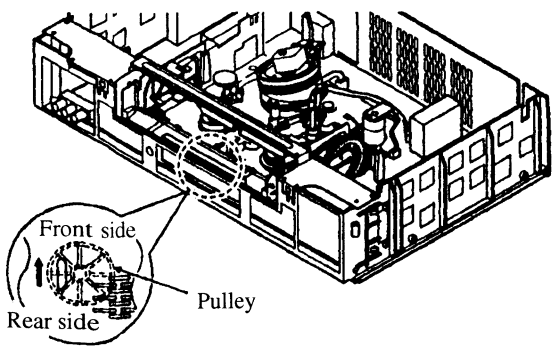


Fig-2-5-5



When viewed form the rear side

Fig-2-5-6

2-5-6. How To Check Various Mechanism Modes without Inserting A Videocassette

1) Attach a blind tapes on the right and left of the cassette holder so that the sensor light should not reach the start sensor and to the end sensor. (Fig-2-5-7.)
2) Release both of the right and left lock levers of the cassette holder so that the cassette holder can be moved down and slotted in.
3) When cassette down is performed, rotating speed of the S reel table increases. If rotation of the S reel table is stopped, the mechanism starts loading. (If rotation of the S reel table is not stopped, eject will be activated.)
4) When loading is completed, rotate with hand the reel table that is opposite side of the presently rotating reel table.
5) In this state of mechanism, various modes can be checked now.

Note: When the reel table that is opposite side of the rotating reel table is turned by hand during playback, fast forward/rewind modes so that the reel pulse should not be sent, the auto eject is activated or the main power is turned off.

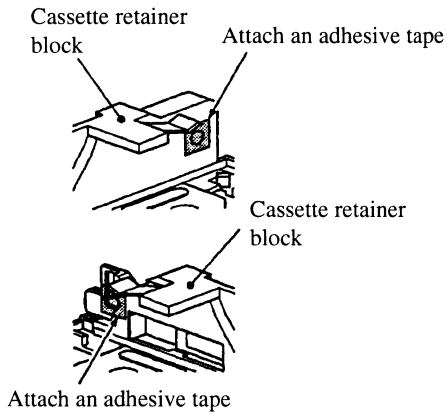


Fig-2-5-7

2-6. REPLACING THE MAIN PARTS

2-6-1. Door Open Lever

1) Rotate the door open lever in the direction of the arrow, and remove the claw of the door open lever that has been inserted in the hole on the left bottom of the right side of the mechanism deck.
Then remove the door open lever from the door open lever shaft and for the door open lever guide by raising the door open lever.

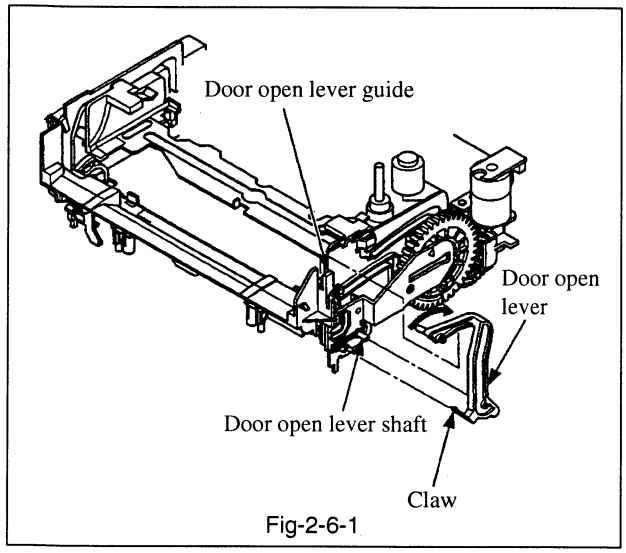


Fig-2-6-1

2) Replace the door open lever with a new door open lever.
3) After the door open lever is replaced, assemble the mechanism by reversing the disassembling procedure.

Note: Attach the door open lever in a manner so that it is located inside the guide.

2-6-2. FL Cassette Guide Assembly

1) Remove the door open lever. (Refer to 2-6-1.)
2) Press the lock levers that are located on both sides of the cassette holder assembly and release the lock. Move the cassette holder assembly until it reaches the vertical shift position of the guide groove. Remove the lamp board in the case that your machine has a lamp board.

Note: When the cassette holder assembly is cannot be moved smoothly, rotate the worm wheel clockwise.

3) While pressing in the craws on the both sides of the FL cassette guide assembly inside, remove the FL cassette assembly by raising it up.

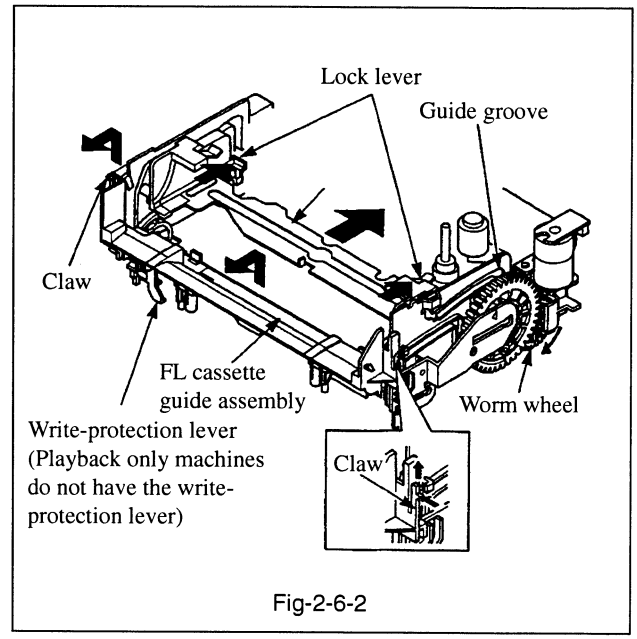


Fig-2-6-2

4) Replace the FL cassette guide assembly with the new FL cassette guide assembly.
5) After the FL cassette guide assembly is replaced, assemble the mechanism by reversing the disassembling procedure.

2-6-3. Cassette Holder Assembly

1) Remove the door open lever. (Refer to 2-6-1.)
2) Remove the FL cassette guide assembly. (Refer to Section 2-6-2.)
3) Move the cassette holder assembly to the front.
4) Remove the cassette holder assembly from the right side of the mechanism deck as follows: Pull the right side of the cassette holder assembly to the front so that the two bosses A and B on the right side of the cassette holder assembly, can be removed from the grooves C and D of the mechanism deck. Then, while releasing the lock lever in the right, raise the cassette holder assembly obliquely and remove the cassette holder assembly from the right side of the mechanism deck.

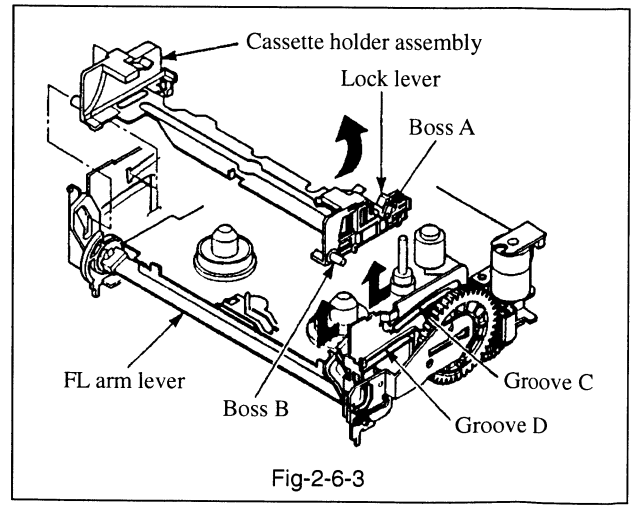


Fig-2-6-3

5) Replace the cassette holder assembly with the new cassette holder assembly.
6) After the cassette holder assembly is replaced, assemble the mechanism by reversing the disassembling procedure.

Note: Attach the cassette holder assembly while releasing the lock lever.

2-6-4. FL Arm Lever

1) Remove the door open lever. (Refer to section 2-6-1.)
2) Remove the FL cassette guide assembly. (Refer to section 2-6-2.)
3) Remove the cassette holder assembly. (Refer to section 2-6-3.)
4) Remove the FL arm lever as follows: Pull the left claw of the FL arm lever in the direction of the arrow A, and remove the FL arm lever from the boss of the mechanism deck. Pull the FL arm lever from its left side to the front and remove the FL arm lever.

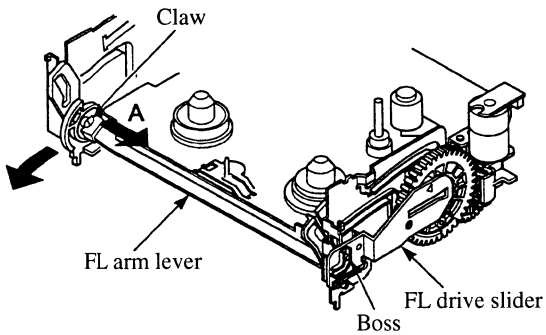


Fig-2-6-4

5) Replace the FL arm lever with a new FL arm lever.
6) After the FL arm lever is replaced, assemble the mechanism by reversing the disassembling procedure.

Note: Attach the FL arm lever so that boss of the FL arm lever enters into the groove of the FL driver slider.

2-6-5. FL Drive Slider, Joint Gear 2, FL Cam Gear and Joint Gear 1

1) Remove the door open lever. (Refer to section 2-6-1.)
2) Remove the FL cassette assembly. (Refer to section 2-6-2.)
3) Remove the cassette holder assembly. (Refer to section 2-6-3.)
4) Remove the FL arm lever. (Refer to section 2-6-4.)
5) Remove the FL drive slider.
Remove the FL drive slider as follows: Slide the FL drive slider slightly to the front in order so that the boss of the mechanism deck is aligned to the portion where the slider groove becomes wider (boss hole). Pull the FL drive slider from the boss and remove the FL slider.

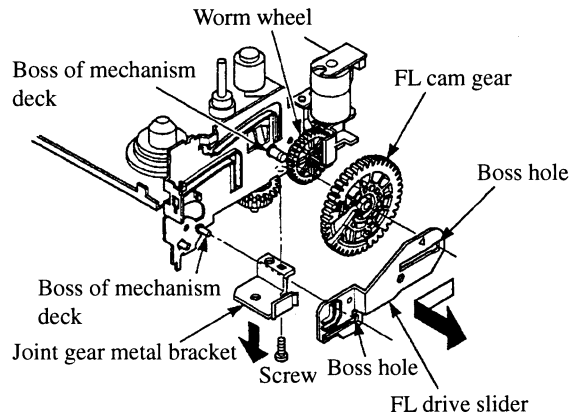


Fig-2-6-5

6) Turn the mechanism deck upside down.
7) Remove one screw from the joint gear metal bracket, and remove the joint gear metal bracket.
8) Remove the joint gear 2.

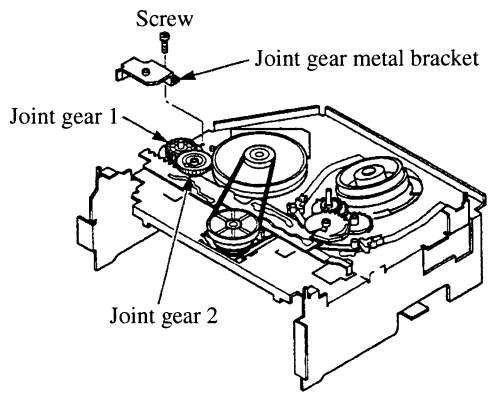


Fig-2-6-6

9) Remove the FL cam gear.
10) Remove the joint gear 1.
11) Replace the parts with the new parts.
Coat the following area of the new parts with grease. (Refer to Fig-2-6-7 to Fig-2-6-11.)

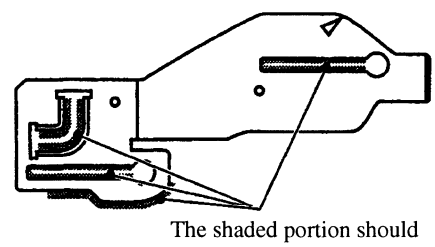


Fig-2-6-7 FL drive slider (Super-V dash mechanism)

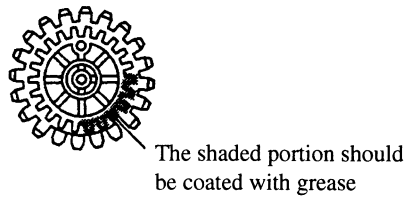


Fig-2-6-8 Joint gear 1

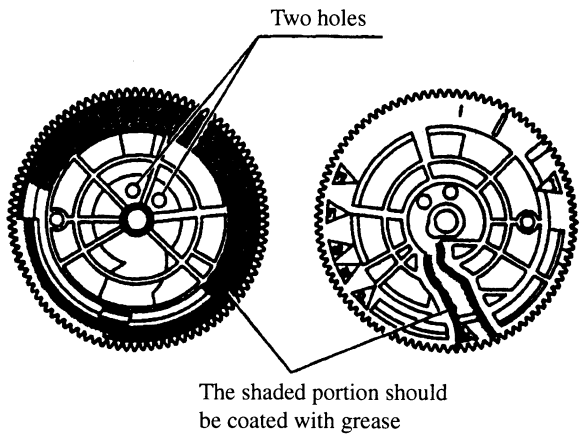


Fig-2-6-9 FL cam gear (Playback only machines)

12) To attach the joint gear 1, attach it so that cut-out of the gear is directed toward the FL cam gear.

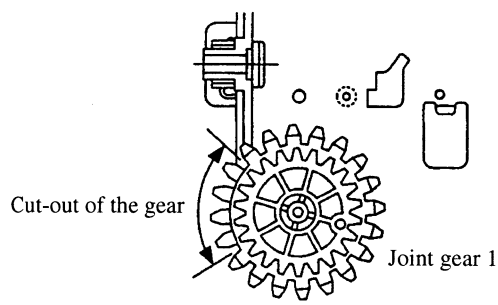


Fig-2-6-10

13) Attach the FL cam gear so that the marking on the FL cam gear is aligned to the center of the worm wheel.

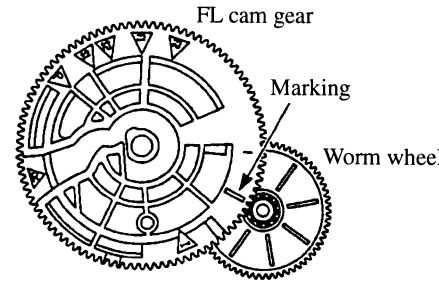


Fig-2-6-11

14) To attach the joint gear 2, align the marking on the joint gear 1 with that on the cam slider.

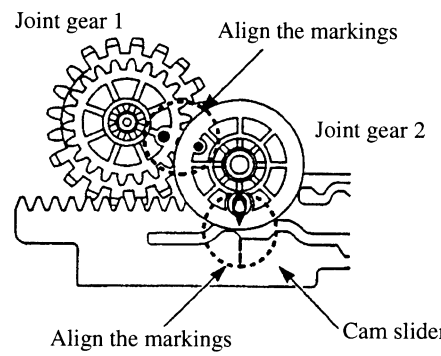


Fig-2-6-12

15) After parts are replaced, assemble the mechanism by reversing the disassembling procedure.

2-6-6. Worm Gear, Worm Gear Holder, Loading Motor and Worm Wheel

1) Remove the claw of the worm gear holder from the cut-out of the worm wheel in the direction of the arrow. Remove the worm gear holder by pulling the worm gear holder downward.
2) Remove the worm gear.
3) To remove the worm wheel, remove the FL cam gear first. (Refer to section 2-6-5.)
4) Remove the worm wheel.
5) Remove the screw that fixes the loading motor, and remove the loading motor.

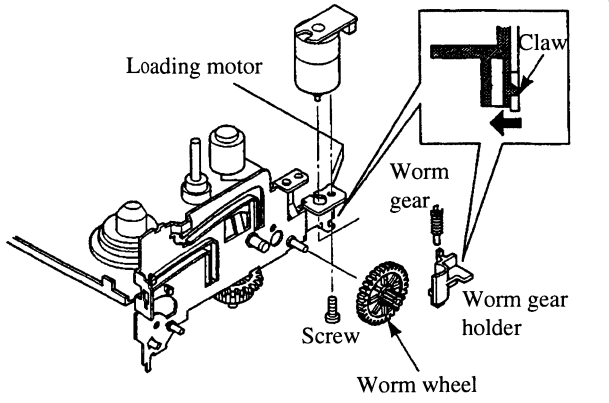
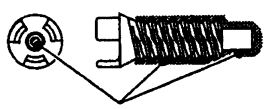


Fig-2-6-13

6) Replace the defective part with the new part. Apply grease on the following area of the new parts.



The shaded portion should be applied with grease

Fig-2-6-14 Worm gear

The shaded portion should be applied with grease

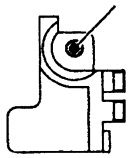


Fig-2-6-15 Worm gear holder

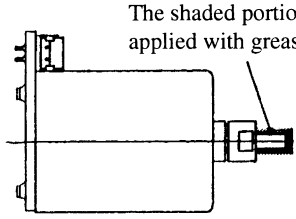


Fig-2-6-16 Loading motor

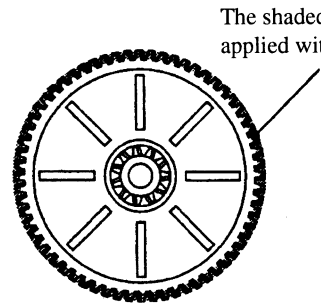


Fig-2-6-17 Worm wheel

7) After replacement of the part, assemble the parts by reversing the steps of the removal procedure.

Note: After attaching the worm gear holder, check that the claw is caught. (Refer to Fig-2-6-13.)

2-6-7. Loading Drive Gear, Cam Slider, S/T Loading Lever Assembly, Pinch Drive Lever, Tension Drive Lever

1) Put the mechanism deck upside down.
2) Remove the reel belt.
3) Remove the screw that fixes the joint gear metal bracket, and remove the joint gear metal bracket. (Refer to section 2-6-5.)
4) Remove the joint gear 2. (Refer to section 2-6-5.)
5) Remove the claw of the loading drive gear from the groove of the mechanism deck, and remove the loading drive gear.
6) Remove the cam slider.

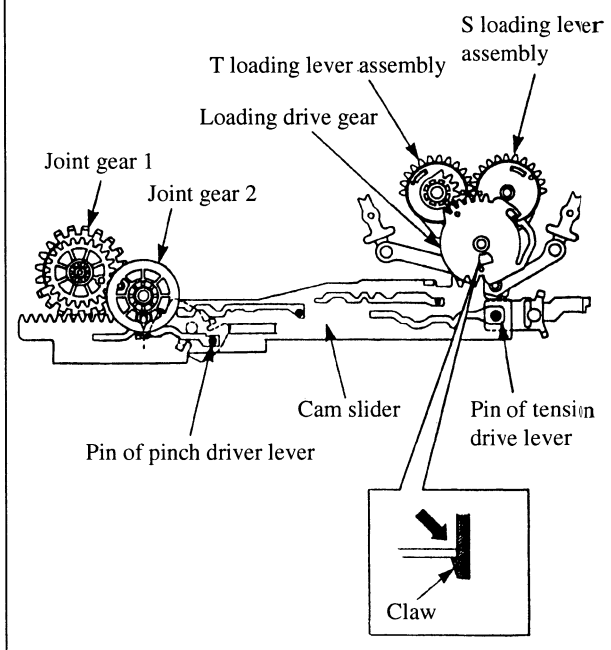


Fig-2-6-18

7) Remove the S/T loading lever assembly.
8) To remove the pinch driver lever, remove the cassette door guide, pinch assembly, joint lever, and pinch drive spring first (Refer to section 2-6-11.). Then, remove the T reel table. (Refer to section 2-6-9.)
Next, remove the pinch driver lever rotating it counterclockwise form the rear aide of the mechanism deck.

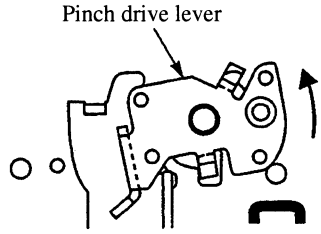


Fig-2-6-19 (Rear side of the mechanism deck)

9) To remove the tension drive lever, remove the S reel table first (Refer to section 2-6-9). Then, rotate the band brake attaching block counterclockwise, after rotating the tension driver lever pull it out.

Note:
- When the band brake attaching block is rotated, insert the screwdriver into the long hole. Be careful not to move the screwdriver up and down.
- After the parts are attached, check the tension post and check the adjustment and back tension. (Refer to section 2-7-1 and 2-7-2 2).)

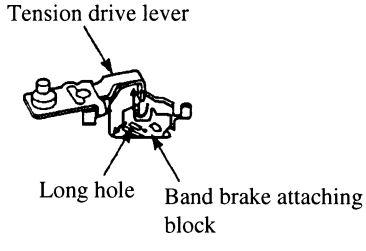


Fig-2-6-20 (Rear side of mechanism deck)

10) Replace to the new part.
Apply grease on the following area of the new parts.

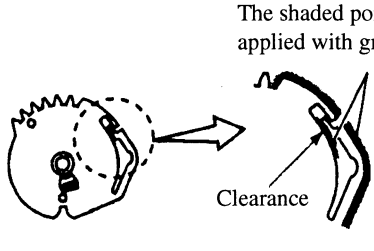


Fig-2-6-21 Loading Drive Lever

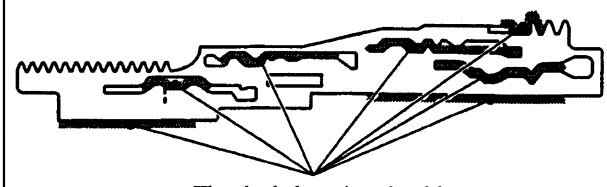


Fig-2-6-22 Cam sliding

11) When attaching the S/T loading lever assembly, align the marks each other.

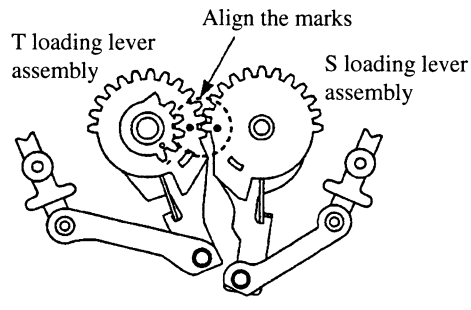


Fig-2-6-23

12) When attaching the cam slider, loading drive gear, and joint gear 2, align with the marked portion.

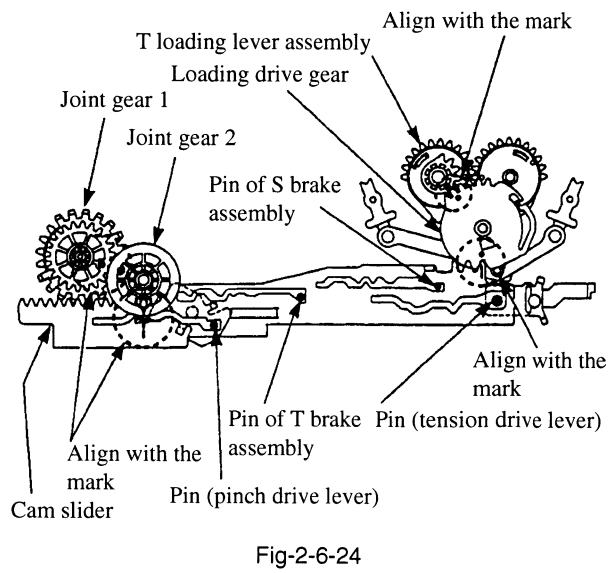


Fig-2-6-24

13) Assemble the parts by reversing the steps of the removal procedure.

2-6-8. Tension Lever, Band Brake, Tension Sleeve

1) Remove the S-brake. (Refer to section 2-6-9.)
2) Remove the tension spring.
3) Raise slightly the hole of the tension sleeve to which the mechanism deck is attached, and turn it either clockwise or counterclockwise. Move the tension sleeve until claw of the tension sleeve agrees with the notch of the mechanism deck, and remove the tension sleeve. Remove the tension lever also.

Note: When replacing the tension lever or the band brake, the tension sleeve does not need to be removed.
Insert the screwdriver to the rectangular hole, rotate it clockwise, and remove the tension lever.
Be careful not to bend the tension lever to up and down.

4) Rotate the claw of the band brake to right in order to align the claw with the groove of the tension lever, and remove the side of the tension lever of the band brake.
5) Align the claw of the band brake with the groove of the band brake attaching position of the mechanism deck side, and remove it.
6) Replace the defective part with the new part.
7) After replacement of the part, attach the part by reversing the steps of the removal procedure.

Note:
- When replacing the tension lever, apply oil on the pivot post.
- Be careful not to stain the felt fabric surface of the band brake, bend, or damage the band brake.

8) After the parts are attached, check that the position of the tension post, and adjust the back tension. (Refer to 2-7-1 and 2-7-2 2).)
9) After replacement of the part, start from the linearity adjustment of running adjustment items.

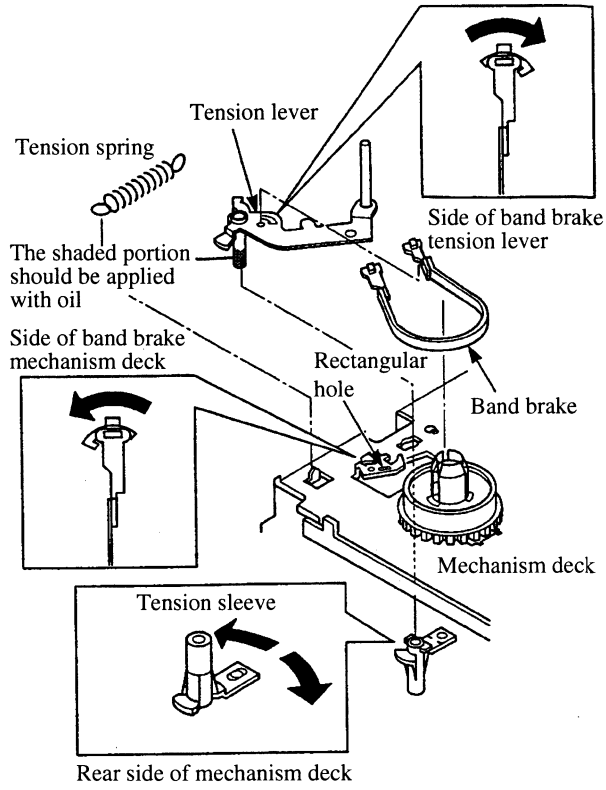


Fig-2-6-25

2-6-9. S Brake Assembly, T Brake Assembly, Idle Lever Assembly

1) Remove the brake spring between the S brake assembly and the T brake assembly from the T side.
2) Remove the claws A and B of the S and T brake assemblies. When the S and T brake assemblies cannot be removed smoothly, release the two claws B of the T brake assembly.
3) Press the idle lever in the direction of the cylinder (arrow direction), and remove the idle lever assembly.

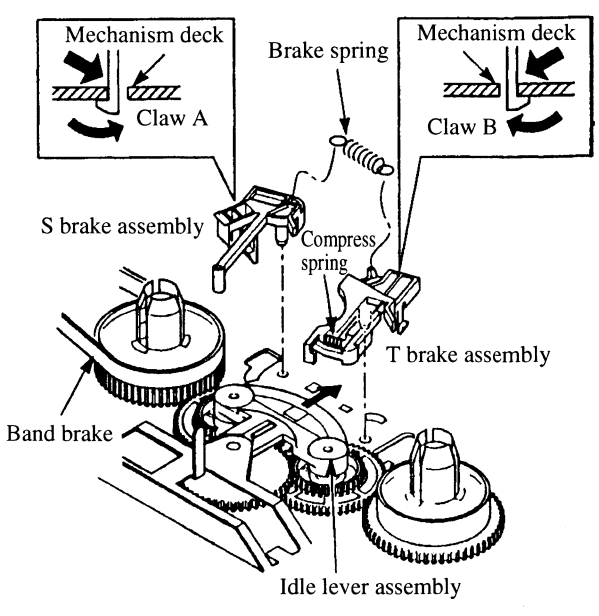


Fig-2-6-26

4) Replace the defective part with the new part.
5) Attach the part by reversing the removing procedure.

Note:
- Check that the pad and the compression spring of the T brake lever assembly have not dropped off. Be careful the pad must not contact with the T reel table when attaching the T brake.
- Check, before attaching the brake spring, that the S and T brake assemblies can rotate smoothly.
- Be careful not to crash the band brake during replacement of the S brake assembly.

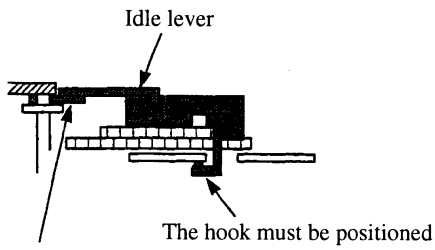

Idle lever
The hook must be positioned beneath the base
Center of rotation must be positioned beneath the base yet above the flange of the center post

Fig-2-6-27

2-6-10. Holder Clutch Assembly, Center Gear Assembly and Up/Down Lever Assembly

1) To remove the center gear assembly and up/down lever assembly, removal of the S/T brake assemblies, idle lever assembly (Refer to section 2-6-9.) and the cam slider. (Refer to section 2-6-7) is required beforehand.
2) Remove the lumirror that fixes the holder clutch assembly, and then remove the holder clutch assembly.
3) Release the two claws of the up/down lever assembly from the mechanism deck, and remove the up/down lever assembly together with the center gear assembly.

Note:
- Clean the center post using the cleaning kit, then apply one drop of oil to the top of the center post.
  (Perform the above describe lubrication when the center gear assembly, up/down lever assembly or holder clutch assembly is replaced.)
- Coat the center gear assembly with grease. (Perform greasing when the center gear assembly or the up/down lever assembly is replaced.)

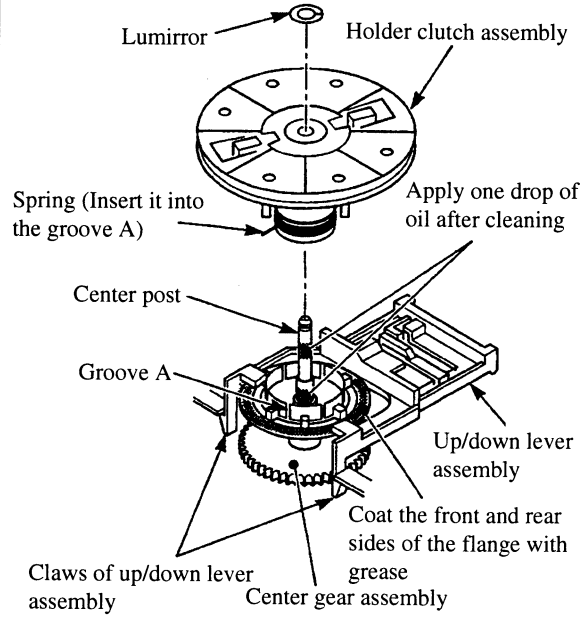

Lumirror
Holder clutch assembly
Spring (Insert it into the groove A)
Apply one drop of oil after cleaning
Center post
Groove A
Up/down lever assembly
Coat the front and rear sides of the flange with grease
Claws of up/down lever assembly
Center gear assembly

Fig-2-6-28

4) Replace the defective part with the new part.
5) After replacement of the part, attach the disassembled parts by reversing the steps of the removal procedure.

Note: Check the reel torque using the torque cassette. (Check the reel torque when the clutch gear assembly or idle lever assembly is replaced.)

6) Attach the center gear assembly together with the up/down lever assembly as follows. Firstly, insert the claw A of the up/down lever assembly into the base, then insert the center gear assembly into the center post so that flange of the center gear assembly is located beneath the up/down lever assembly guide.

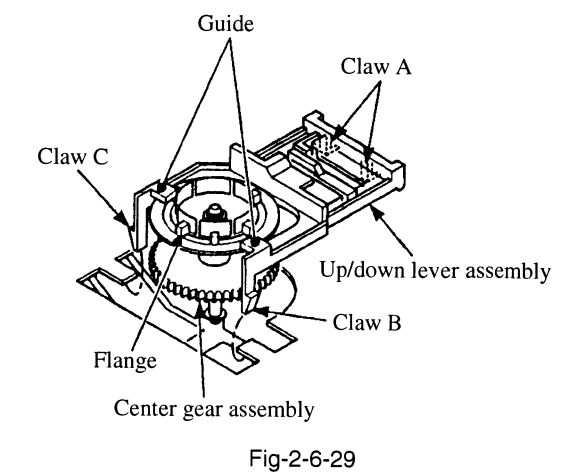


Fig-2-6-29

Finally, push the center gear assembly again until the claw B of the up/down lever assembly is locked.

Note: Check that the spring of the holder clutch assembly is located at the correct position.

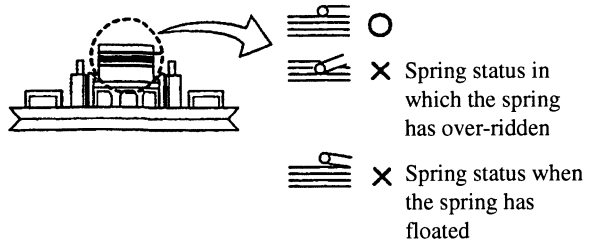


Fig-2-6-30

Note:
- Insert the spring of the holder clutch assembly into any of the six grooves of the center gear assembly by its own weight. Confirm that the spring has entered into any of the six grooves correctly, then fix the lumirror.
- Do not re-use the lumirror whose slits have already opened. Be sure to replace the old lumirror and replace with the new one.

2-6-11. S and T Reel Tables

1) Remove the S and T brakes. (Refer to section 2-6-9)
2) Remove the band brake. (Refer to section 2-6-8)
3) Remove the S and T reel tables in the manner of pulling them out from the reel shafts A and B.
4) After cleaning the reel shafts A and B using the cleaning kit, coat the top surface of the reel shafts A and B, and their bottom surface with oil.
5) Replace the defective part with the new part.
6) After replacing the new part, attach the disassembled parts by reversing the steps of removal procedure.

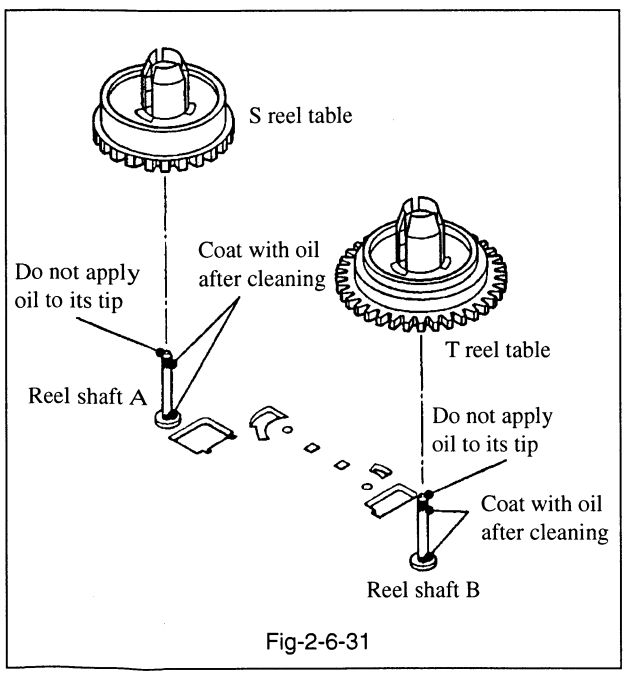

S reel table
Coat with oil after cleaning
Do not apply oil to its tip
T reel table
Reel shaft A
Do not apply oil to its tip
Coat with oil after cleaning
Reel shaft B

Fig-2-6-31

2-6-12. S and T Slider Assemblies

1) Remove the S and T loading lever assemblies. (Refer to section 2-6-7)
2) Remove the S brake assembly. (Refer to section 2-6-9.)
3) Remove the tension lever. (Refer to section 2-6-8.)
4) To replace the T slider assembly, remove the slider cam first. When it is difficult to remove the slider cam, remove the holder clutch assembly and up/down lever. (Refer to section 2-6-10.)
5) Move by sliding, the S and T slider assemblies to the notches of the S and T loading grooves of the mechanism deck, and remove the S and T slider assemblies.
6) Replace the defective part with the new part.
7) After replacement of the part, attach the disassembled parts by reversing the steps of removal procedure.
8) After the parts are attached, perform the tape run system adjustment referring to section 2-7-3.

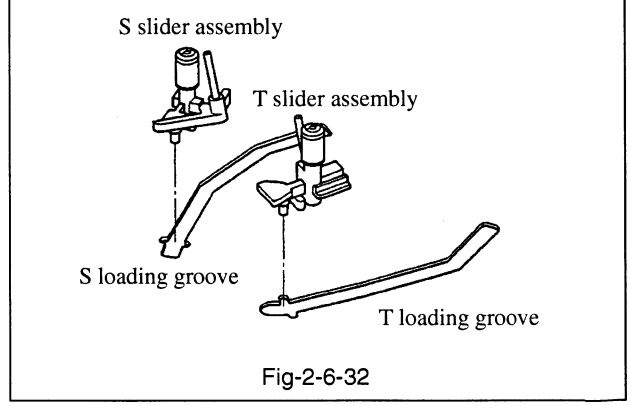


Fig-2-6-32

2-6-13. Pinch Assembly, Guide Lever No. 9, Cassette Door Guide

1) Raise the claw of the cassette door guide from the mechanism deck, rotate the cassette door guide clockwise, and remove the cassette door guide.
2) Remove the pinch assembly from the pinch pivot post in a manner of pulling it up vertically.
3) Remove the pinch driver lever, the joint lever that connects the pinch assembly, and remove the pinch drive spring from the side of the pinch drive lever.
4) Remove the guide No. 9 spring that is hooked between the guide No. 9 lever and the mechanism deck.
5) Remove the guide No. 9 lever.
6) Replace the defective part with the new part.
7) After replacement of the part, attach the disassembled parts by reversing the steps of removal procedure.
8) After the parts are attached, perform the tape run system adjustment referring to 2-7-3.

Note:
- After the cassette door guide is attached, check that the claw is hooked.
- Be careful not to touch the surface of the pinch roller or grease must not be attached to surface of the pinch roller.
- Be sure to coat the outer circumference of the pinch pivot post where it contacts with the pinch assembly, with grease.
- When replacing the guide No. 9 lever, be sure to apply oil on the outer circumference of the pinch pivot and coat the end surface of the guide post with grease.
  Also, be careful not that grease must not be attached to the tape running surface of the guide No. 9 post.
- Check that the guide post end surface of the guide No. 9 lever touches the top surface of the mechanism deck.
- Be sure to insert the pinch drive spring into the small hole of the base.

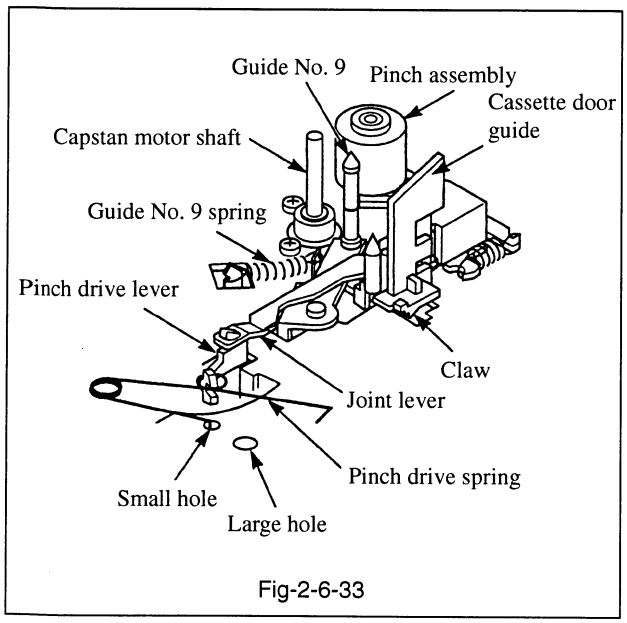


Fig-2-6-33

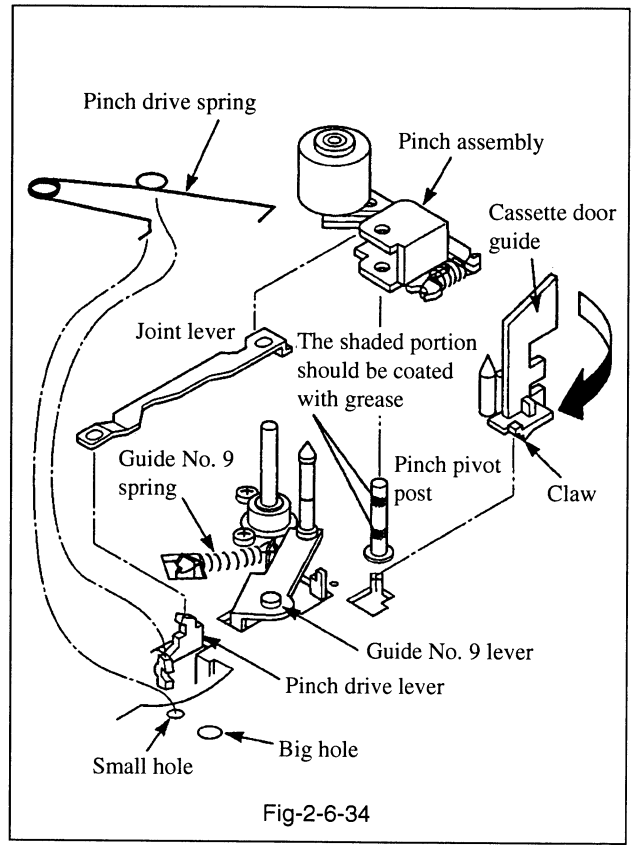


Fig-2-6-34

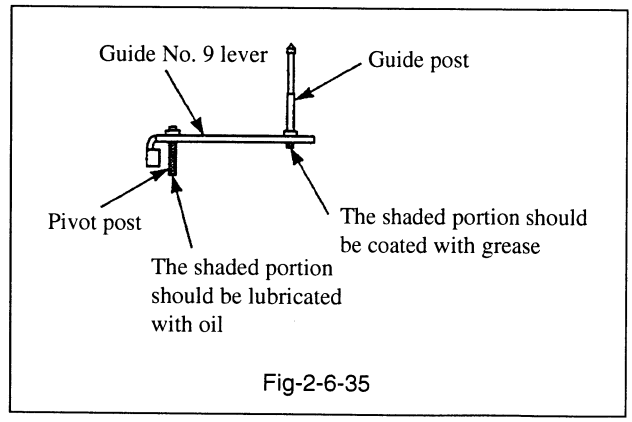

Guide No. 9 lever
Guide post
Pivot post
The shaded portion should be coated with grease
The shaded portion should be lubricated with oil

Fig-2-6-35

2-6-14. FE Head

1) Remove the screw that fixes the FE head and remove the FE head.
2) Replace the defective part with the new part.
3) After replacement of the part, attach the disassembled parts by reversing the steps of removal procedure.
4) After the parts are attached, perform the tape run system adjustment referring to section 2-7-3.

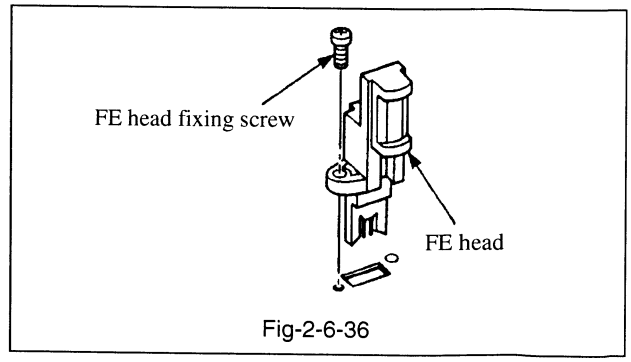


Fig-2-6-36

2-6-15. ACE Head Assembly

1) Remove FFC from the connector.
2) Remove the ACE head assembly fixing screw and remove the ACE head assembly.
3) Replace the ACE head with the new ACE head.

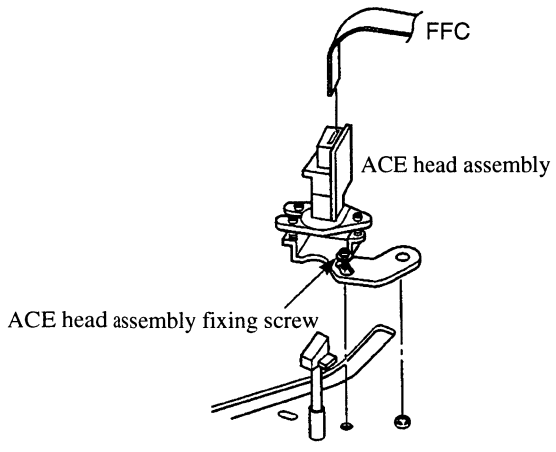


Fig-2-6-37

4) To attach the ACE head assembly to the mechanism deck, align the boss hole of the ACE head fixing bracket with the boss of the mechanism deck. Then align the slit position of the mechanism deck with the slit position of the ACE fixing bracket before attaching it.

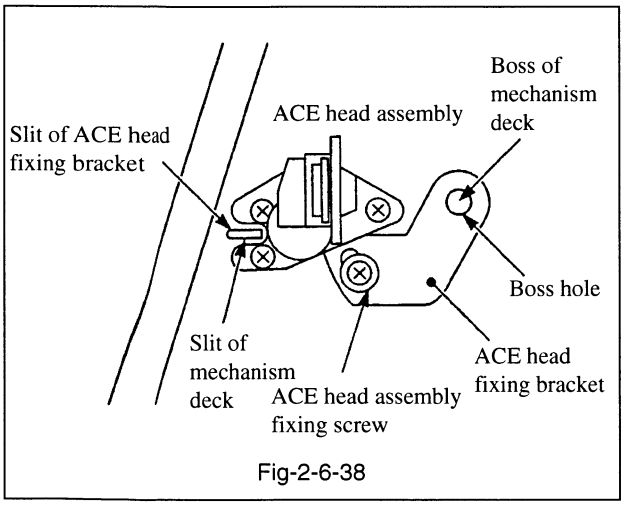

Boss of mechanism deck
ACE head assembly
Slit of ACE head fixing bracket
Boss hole
Slit of mechanism deck
ACE head assembly fixing screw
ACE head fixing bracket

Fig-2-6-38

5) After replacement of the part, attach the disassembled parts by reversing the steps of removal procedure.
6) After the parts are attached, perform the tape run system adjustment referring to 2-7-3.

2-6-16. Head Cleaner Assembly, Head Cleaner Sleeve

1) Remove the hook of the head cleaner assembly from the mechanism deck. Remove the head cleaner assembly by pulling it upward.
2) To replace the head cleaner sleeve, remove the head cleaner sleeve by raising the portion A and by rotating it by 90 degrees.

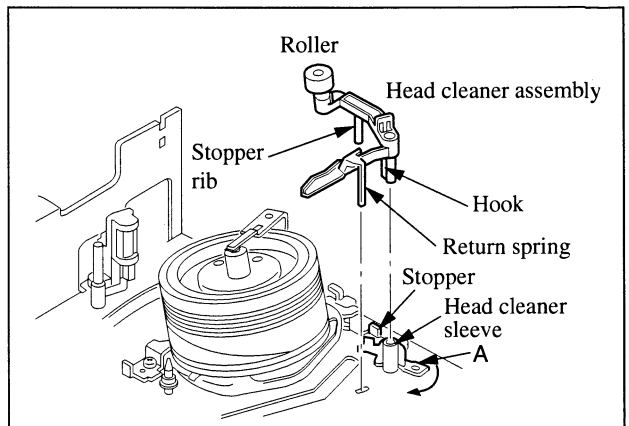


Fig-2-6-39

3) Replace the head cleaner assembly with the new one.
4) Attach the disassembled parts by reversing the steps of the removal procedure.

Note:
- Be careful grease must not be attached or oil or similar materials to the roller.
- To attach the head cleaner assembly, attach it to the inside (cylinder side) of the stopper of the cylinder fixing bracket.
  At the same time, be sure insert the return spring into the hole of the main base.

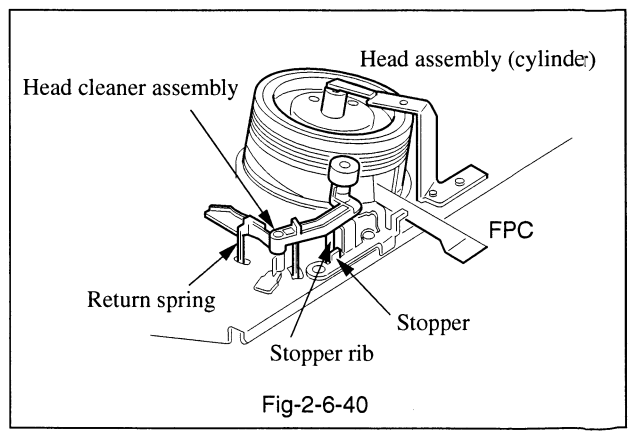


Fig-2-6-40

2-6-17. DRUM AND BRUSH ASSEMBLY

1) Remove the screw fixing the drum brush.
2) Remove the drum brush.
3) Replace with the new drum brush.

Note: Be careful not to apply any force to the cylinder.

4) After replacing the drum brush, assemble the mechanism by reversing the removing procedure.

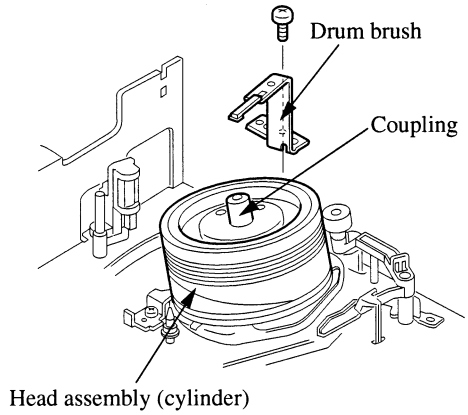


Fig-2-6-41

2-6-18. Cylinder Retainer

1) Remove the head cleaner assembly. (Refer to section 2-6-16.)
2) Remove the three screws (a, b and c) that fix the cylinder retainers (A, B and C). Remove the cylinder retainers by moving them in the direction of the arrow respectively.

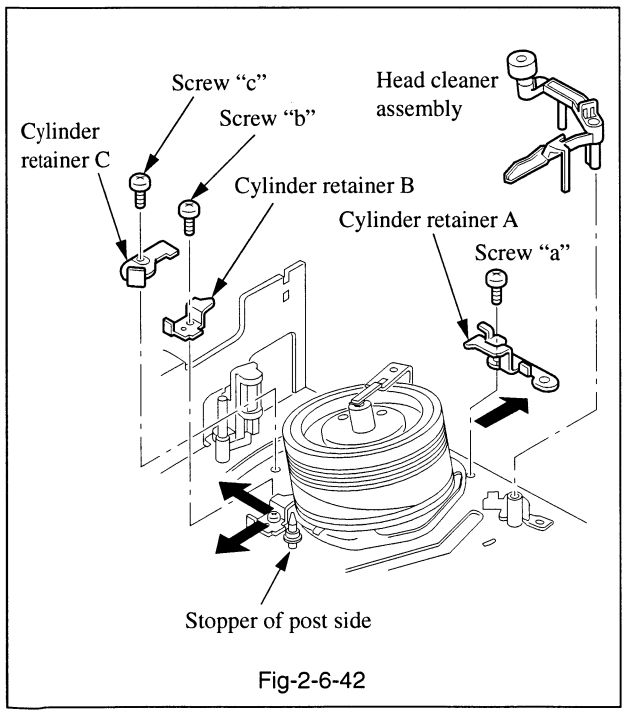


Fig-2-6-42

3) Replace the defective part with the new part.
4) After replacement of the part, attach the disassembled parts by reversing the steps of the removal procedure.
5) Push the cylinder retainers A and B in the direction of the arrow until they gently contact with cylinder, then tighten the screws "a" and "b".
   Align the boss of the mechanism deck with the holes of the retainer, then tighten the screw "c" to fix the cylinder retainer C.

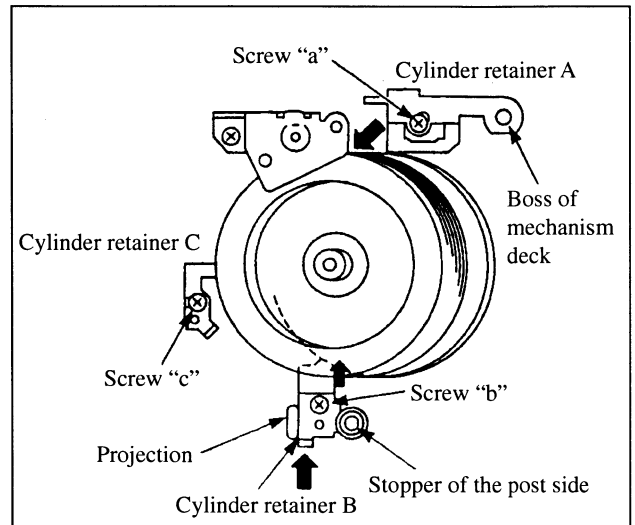


Fig-2-6-43

Note:
- The tightening torque for the cylinder retainer screws a, b and c is 294 to 392 mNm (3 to 4 kg•cm).
- When attaching the cylinder retainer A, be careful of the position where FPC is routed through.
  (Refer to section 2-6-19.)
- When replacing the cylinder retainer C, be careful not to damage the cylinder or the tape guides.
  At the same time, be careful so that the screwdriver must not touch the cylinder, when loosening or tightening the screw "c" of the cylinder retainer C.

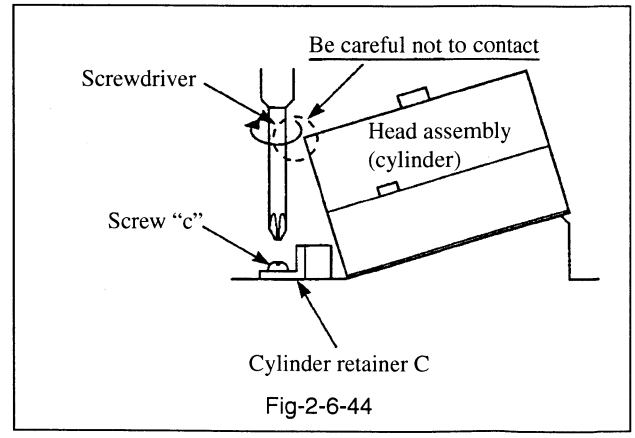


Fig-2-6-44

2-6-19. Head Assembly (cylinder)

<Check>

1) Check that the tape running surface of the head assembly (cylinder) has no scratch.
2) Check that rotation of the head assembly (cylinder) is normal.
3) Check that the video head is not damaged.
4) Check that the video head is not clogged. (When clogging cannot be removed by cleaning.)
5) Check that FPC is not damaged.

   It any abnormality is found during the above steps of 1) to 5), replace the head assembly (cylinder).

<Replacement>

1) Remove the drum brush. (Refer to section 2-6-17.)
2) Remove the head cleaner assembly. (Refer to section 2-6-16.)
3) Remove FPC from the MAIN C.B.
4) Remove the screw that fixes the drum brush, and remove the drum brush.
5) Remove the cylinder retainer A, cylinder retainer B, and cylinder retainer C. (Refer to section 2-6-18.)
6) Remove the head assembly (cylinder).
7) Replace the head assembly with the new head assembly.

Note: When attaching the new head assembly, be careful of the direction of the head assembly.

8) After replacement of the head assembly, attach the disassembled parts by reversing the steps of the removal procedure.
   When attaching the head assembly (cylinder), press it in the direction of the arrow "a", press the cylinder retainer A in the direction of the arrow "b", press the cylinder retainer B in the direction of "c" gently and fix them with the respective screws.
   (Screw tightening torque: 294 to 392 mNm (3 to 4 kg•cm)
   When attaching the drum brush, align the boss of the mechanism deck with the boss hole of the metal bracket, and then tighten the screw.
   (Screw tightening torque: 294 to 392 mNm (3 to 4 kg•cm)

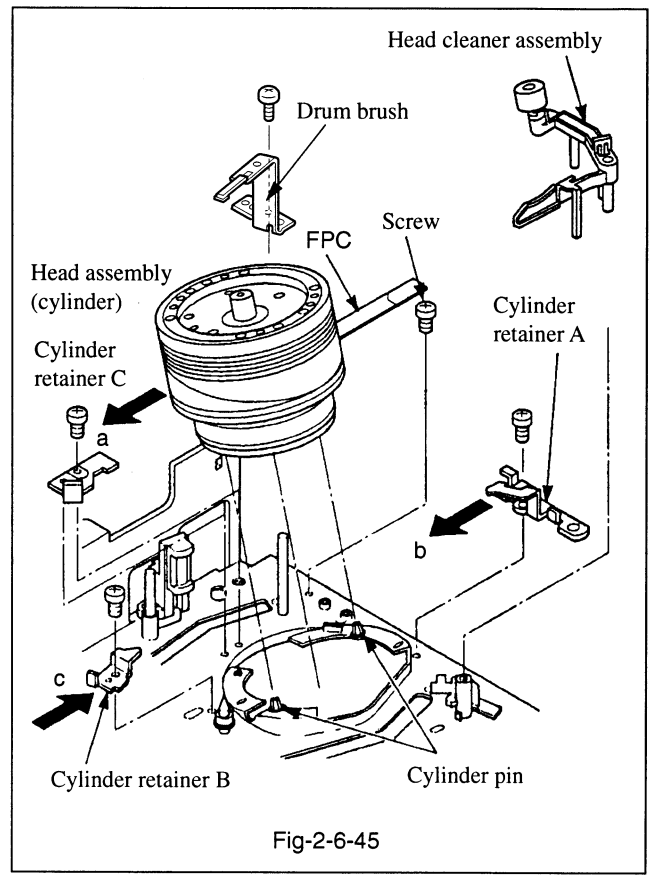


Fig-2-6-45

Note:
- When attaching the cylinder retainer A, check that FPC is securely hooked on the groove in the lower side of the head assembly, and route it under arm. However, the above described procedure does not apply to the head assembly type that does not have the cylinder window.
- Be careful not to touch the video head directly or not to damage the cylinder.

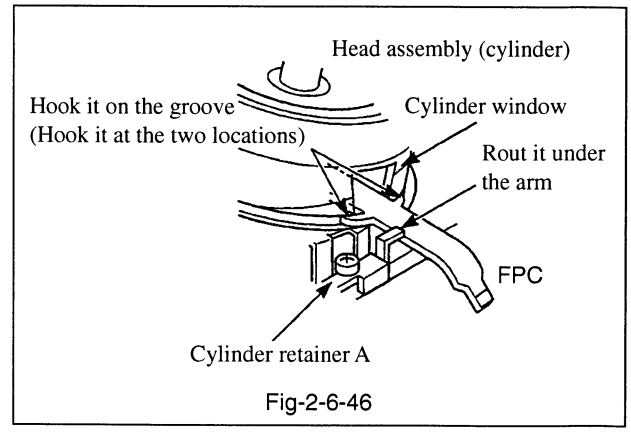


Fig-2-6-46

10) After the parts are attached, perform the tape run system adjustment referring to section 2-7-3.

2-6-20. Capstan Motor Assembly, Reel Belt

1) Remove the reel belt.
2) While holding the capstan motor assembly from the rear of the mechanism deck, remove the three screws that fix the capstan motor, from the front of the mechanism deck. Then remove the capstan motor assembly.
3) Replace to the capstan motor assembly with the new capstan motor assembly.
4) While being careful not to damage the capstan motor shaft or the motor itself, insert the capstan motor assembly from the rear of the mechanism deck in a way that the positioning hole of the mechanism deck agrees with the positioning hole of the capstan motor assembly.
5) While holding the capstan motor assembly from the rear of the mechanism deck, attach the three fixing screws and tighten them with equal force from the front of the mechanism deck. When attaching the capstan motor assembly, the positioning hole of the mechanism deck must agree with the positioning hole of the capstan motor assembly.

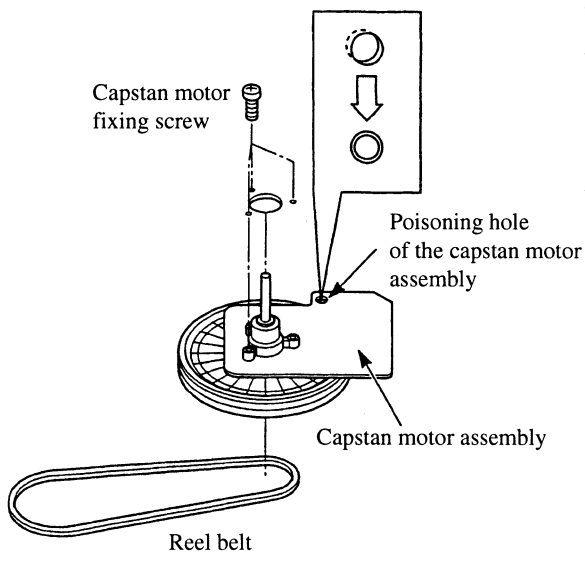


Fig-2-6-47

Note:
- Do not re-use the screw that has been removed once.
- When attaching the capstan motor assembly, be careful that it does not float from the mechanism deck.

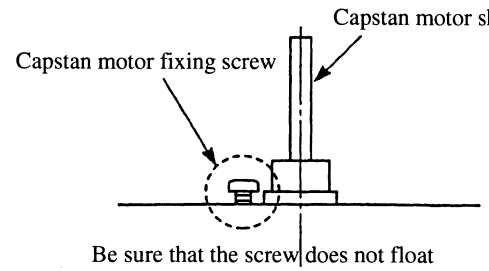


Fig-2-6-48

6) After replacement of the reel belt, attach the disassembled parts by reversing the steps of the removal procedure.

Note: Be careful the belt is not twisted or grease is not attached to the belt.

7) After the parts are attached, perform the tape run system adjustment referring to section 2-7-3.

2-6-21. Cap of the Guide No. 8

1) Remove the cap from the guide No. 8, and press-fit the replacement cap to the guide No. 8.
2) Attach the cap to the guide No. 8 with its inclined surface facing toward the cassette.

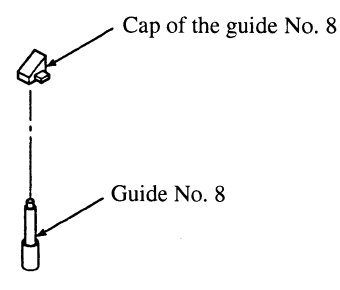


Fig-2-6-49

2-7. Check and Adjustment

2-7-1. Checking Position of the Tension Post

1) Remove the cassette holder assembly from the front loading mechanism, and rotate the worm wheel clockwise until the cam gear arrives at the playback mode position. (Refer to Fig-2-5-2 Cam Position.)
2) Rotate slowly the S reel table clockwise by two full turns.
3) While rotating the S reel table, insert the flat head (-) screwdriver tip into the slot of the adjuster and rotate the screwdriver clockwise or counter-clockwise until the outer circumference in the top left of the tension lever agrees with the inscription mark on the mechanism deck.
4) Rotate the S reel clockwise again. After turning the S reel clockwise, check that the difference between outer circumference in the top left and the inscription mark is 1 mm or less.

Note:
- The longer inscription mark is located 1.3 mm away from the curved surface of the mechanism deck. Use the longer inscription mark as a guide line for checking step 4).
- When rotating the adjuster, do not apply force in the vertical (up/down) direction.

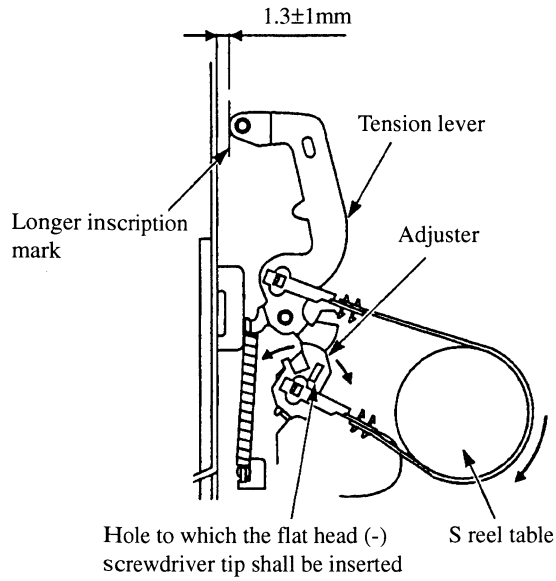


Fig-2-7-1

2-7-2. Checking Reel Torque

1) Reel torque

① Reel torque during REV (reverse playback) ..... supply side
When the reel torque is small, a tape cannot be wound onto the supply reel table. When the reel torque is too large, it can damage a tape.

② Reel torque during REC/PLAY (recording and playback) ..... take-up side
When the reel torque is small, a tape cannot be wound onto the take-up reel table. When the reel torque is too large, an abnormal tension is applied to a tape that can elongate a tape.

③ Check
Use the torque cassette and check that the respective torque values are within specifications.

REV	14.2±3.9 mNm (145±40g•cm)
REC/PLAY	8.1±2.7 mNm (82.5±27.5g•cm)

2) Checking the reel torque and the back tension

① Record the off-the-air TV broadcast signal over the entire length of a torque cassette in the SP mode.

② Insert the torque cassette into the VTR, and rewind it to the tape end.

③ Enter the REV (reverse playback) mode and reverse the tape about 15 seconds. Then check that the winding torque reading which is shown by the meter on the left side of the torque cassette, satisfies the winding torque as described above.

④ Then, rewind the tape to the tape top. Enter the PLAY mode.
After playing back the tape for about 30 seconds, check that the torque reading shown by the meter on the right side of the torque cassette, is in the range of 4.4 to 9.8 mNm (45 to 100g•cm).
At the same time, check that the back tension reading that is shown by the meter on the left side of the torque cassette, is in the range of 4 to 7 mNm (41 to 71 g•cm).

⑤ When the REV mode torque or the PLAY mode torque is out of the specifications, replace the clutch gear assembly. (Refer to section 2-6-10.)

⑥ When the clutch gear assembly and/or idle lever assembly is replaced, check the reel torque.

3) Precautions when using the torque cassette

① Before inserting the torque cassette into a VTR, remove the tape slack from the torque cassette. To remove the tape slack, rotate the reels in a cassette in their tape-winding directions. (Because the torque cassette does not have the reel brake, tape slack can easily occur.)

② Do not perform FF (fast forward) or REW (rewind) with the torque cassette.

③ Check the followings when the torque cassette is inserted into a VTR.

- Tape must not override upon the cap of the guide No. 8, or tape must not go across the cap of the guide No. 8.
  If the tape is found overridden upon the cap of the guide No. 8, return the tape gently to the normal position with utmost care not to damage the tape.
- Tape must not have any tape slack.
  If tape slack is found in the torque cassette, perform either CUE (fast forward playback) or REV (reverse playback) and stop the tape. Check that tape slack has not occurred when tape is stopped from either CUE (fast forward playback) or REV (reverse playback).
- After performing the above checks, start any adjustment and/or check.

④ Precaution when taking out the torque cassette

- Before taking out the torque cassette from a VTR, be sure enter the STOP mode, wait a few seconds and then check that there is no tape slack on the torque cassette tape. Then press the EJECT button.

⑤ If the above steps 1) to 4) are not performed, the torque cassette tape will be damaged and the correct measurement cannot be performed.

⑥ When the tape is damaged or become old, the rotary head of the cylinder can be damaged. Exchange the tape of a torque cassette with the new tape by adhering the tape of the following length.
Use the tape T-120 with length of 10 m.

2-7-3. Adjustment of tape run system

The tape run system has already been precisely adjusted before shipment from the factory. Check and adjustment of the tape run system becomes necessary only when noise occurs on a monitor display, or when a tape is damaged by the tape run system, or a part/component of the tape run system whose adjustment procedure is shown in the following paragraph is replaced.
The electric signal output pins that are required for the tape run system adjustment, are different in the respective models. Be sure to refer to the test pin layout diagram that is shown on the Electrical System Adjustment Procedure of each Service Manual.

1) Adjustment points

① Criteria of adjustment

The fundamental concept of the tape run system adjustment is as follows: The tape run system adjustment uses the height of the lower flange of the guide No. 8 as the reference. Therefore, do not apply any excessive force to the mechanism deck that can change the height of the lower flange of the guide No. 8 because this is the reference height of all other mechanical parts.

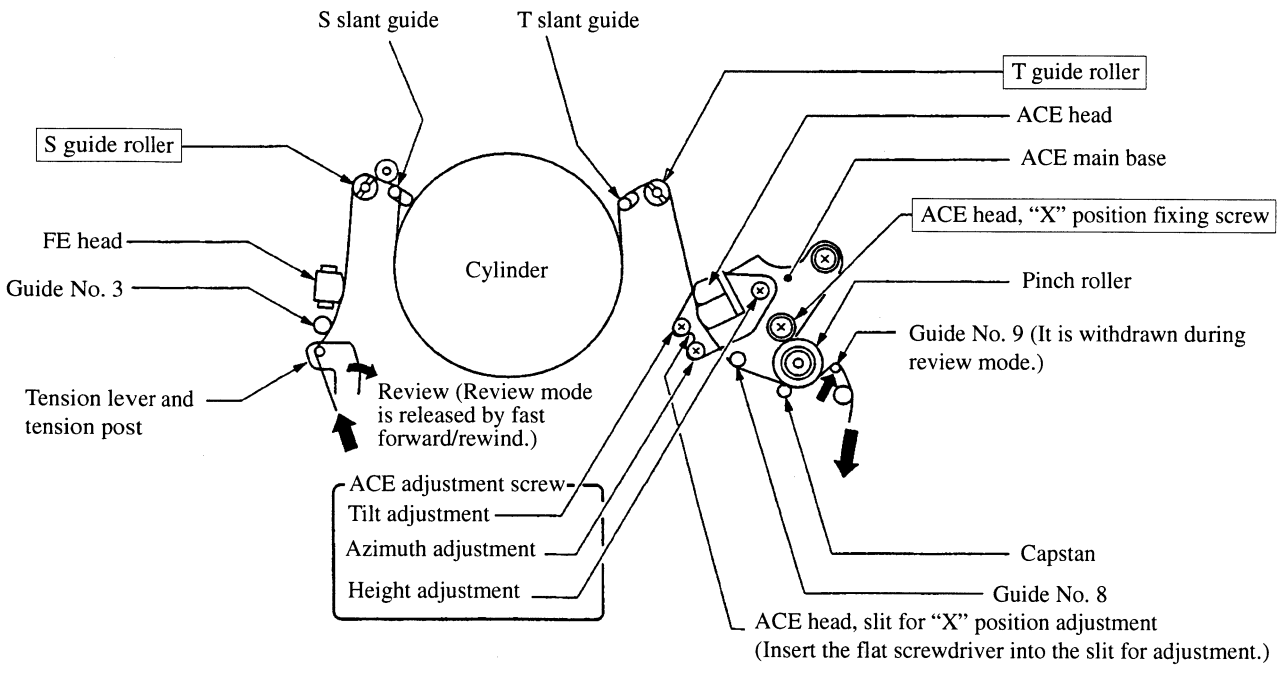
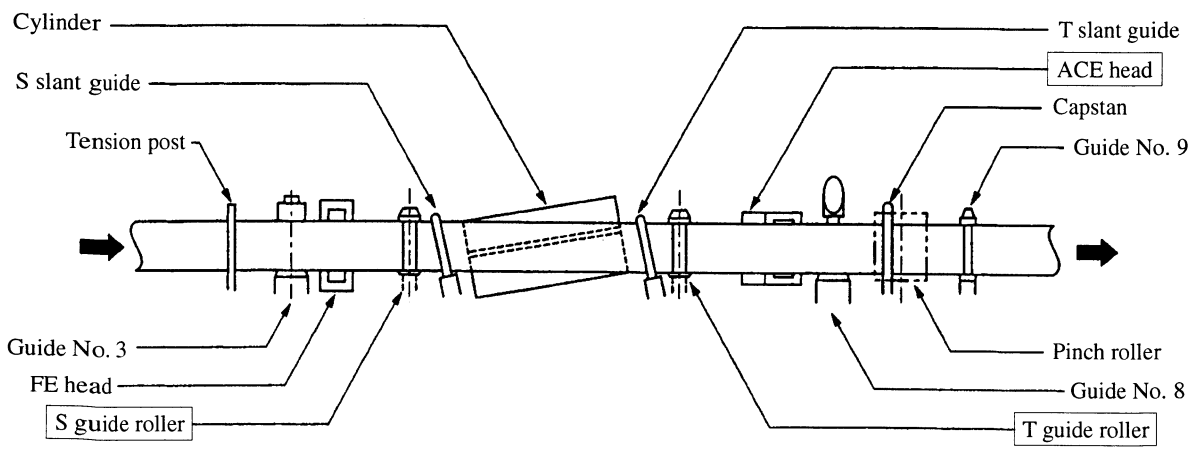


Fig-2-7-2



The part/component shown in the square (☐), is the adjustment point.

Fig-2-7-3

2) Adjustment flow chart

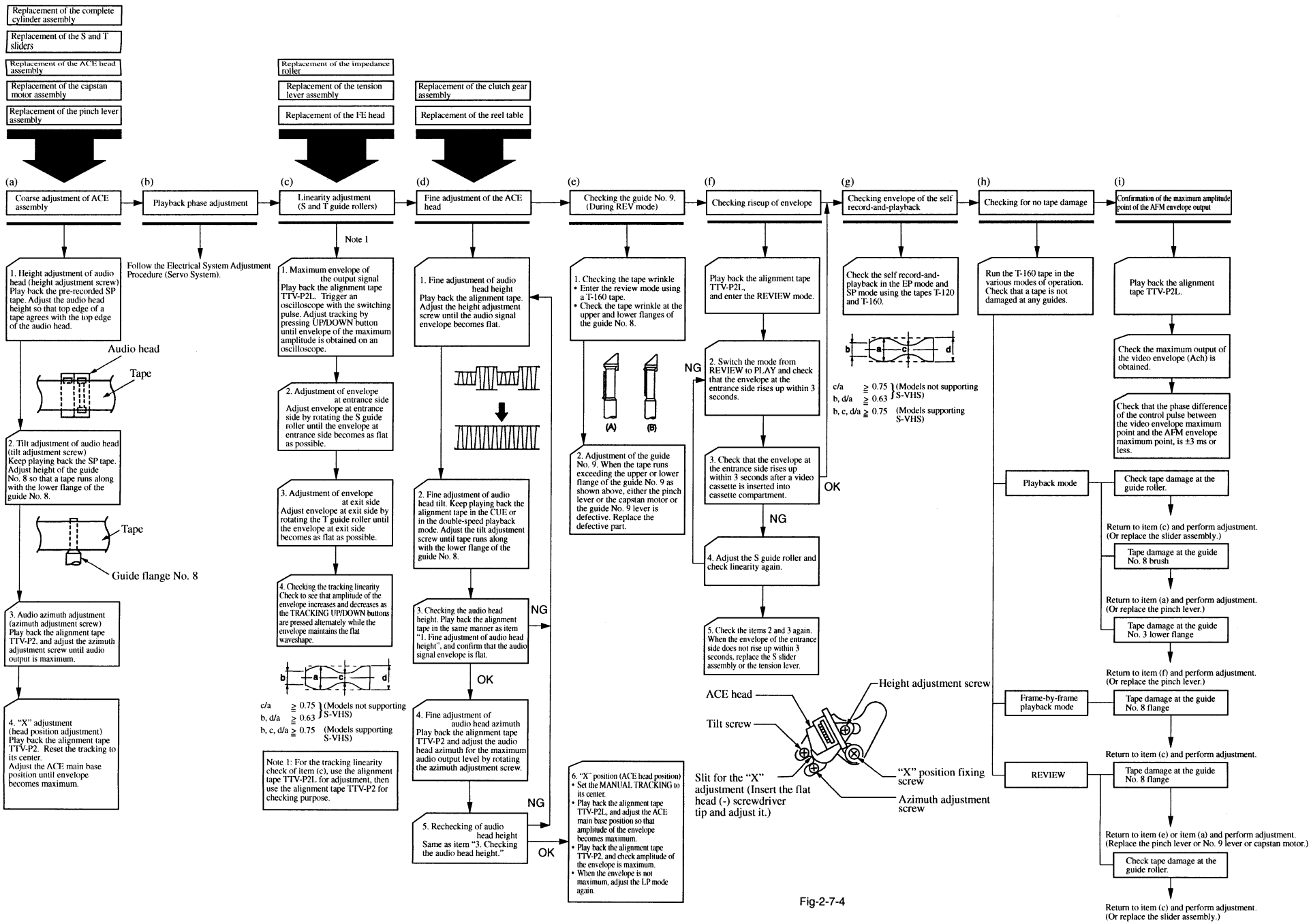

Replacement of the complete cylinder assembly
Replacement of the S and T sliders
Replacement of the ACE head assembly
Replacement of the capstan motor assembly
Replacement of the pinch lever assembly
Replacement of the impedance roller
Replacement of the tension lever assembly
Replacement of the FE head
Replacement of the clutch gear assembly
Replacement of the reel table
(a) Coarse adjustment of ACE assembly
(b) Playback phase adjustment
(c) Linearity adjustment (S and T guide rollers)
(d) Fine adjustment of the ACE head
(e) Checking the guide No. 9. (During REV mode)
(f) Checking riseup of envelope
(g) Checking envelope of the self record-and-playback
(h) Checking for no tape damage
(i) Confirmation of the maximum amplitude point of the AFM envelope output
1. Height adjustment of audio head (height adjustment screw) Play back the pre-recorded SP tape. Adjust the audio head height so that top edge of a tape agrees with the top edge of the audio head.
Audio head
Tape
2. Tilt adjustment of audio head (tilt adjustment screw) Keep playing back the SP tape. Adjust height of the guide No. 8 so that a tape runs along with the lower flange of the guide No. 8.
Tape
Guide flange No. 8
3. Audio azimuth adjustment (azimuth adjustment screw) Play back the alignment tape TTV-P2, and adjust the azimuth adjustment screw until audio output is maximum.
4. "X" adjustment (head position adjustment) Play back the alignment tape TTV-P2. Reset the tracking to its center. Adjust the ACE main base position until envelope becomes maximum.
Follow the Electrical System Adjustment Procedure (Servo System).
Note 1
1. Maximum envelope of the output signal Play back the alignment tape TTV-P2L. Trigger an oscilloscope with the switching pulse. Adjust tracking by pressing UP/DOWN button until envelope of the maximum amplitude is obtained on an oscilloscope.
2. Adjustment of envelope at entrance side Adjust envelope at entrance side by rotating the S guide roller until the envelope at entrance side becomes as flat as possible.
3. Adjustment of envelope at exit side Adjust envelope at exit side by rotating the T guide roller until the envelope at exit side becomes as flat as possible.
4. Checking the tracking linearity Check to see that amplitude of the envelope increases and decreases as the TRACKING UP/DOWN buttons are pressed alternately while the envelope maintains the flat waveshape.
b a c d
c/a ≧ 0.75 } (Models not supporting S-VHS)
b, d/a ≧ 0.63
b, c, d/a ≧ 0.75 (Models supporting S-VHS)
Note 1: For the tracking linearity check of item (c), use the alignment tape TTV-P2L for adjustment, then use the alignment tape TTV-P2 for checking purpose.
1. Fine adjustment of audio head height Play back the alignment tape. Adjust the height adjustment screw until the audio signal envelope becomes flat.
2. Fine adjustment of audio head tilt. Keep playing back the alignment tape in the CUE or in the double-speed playback mode. Adjust the tilt adjustment screw until tape runs along with the lower flange of the guide No. 8.
3. Checking the audio head height. Play back the alignment tape in the same manner as item "1. Fine adjustment of audio head height", and confirm that the audio signal envelope is flat.
NG
OK
4. Fine adjustment of audio head azimuth Play back the alignment tape TTV-P2 and adjust the audio head azimuth for the maximum audio output level by rotating the azimuth adjustment screw.
5. Rechecking of audio head height Same as item "3. Checking the audio head height."
NG
OK
1. Checking the tape wrinkle
• Enter the review mode using a T-160 tape.
• Check the tape wrinkle at the upper and lower flanges of the guide No. 8.
(A) (B)
2. Adjustment of the guide No. 9. When the tape runs exceeding the upper or lower flange of the guide No. 9 as shown above, either the pinch lever or the capstan motor or the guide No. 9 lever is defective. Replace the defective part.
6. "X" position (ACE head position)
• Set the MANUAL TRACKING to its center.
• Play back the alignment tape TTV-P2L, and adjust the ACE main base position so that amplitude of the envelope becomes maximum.
• Play back the alignment tape TTV-P2, and check amplitude of the envelope is maximum.
• When the envelope is not maximum, adjust the LP mode again.
Play back the alignment tape TTV-P2L, and enter the REVIEW mode.
2. Switch the mode from REVIEW to PLAY and check that the envelope at the entrance side rises up within 3 seconds.
NG
3. Check that the envelope at the entrance side rises up within 3 seconds after a video cassette is inserted into cassette compartment.
OK
NG
4. Adjust the S guide roller and check linearity again.
5. Check the items 2 and 3 again. When the envelope of the entrance side does not rise up within 3 seconds, replace the S slider assembly or the tension lever.
ACE head
Tilt screw
Slit for the "X" adjustment (Insert the flat head (-) screwdriver tip and adjust it.)
Height adjustment screw
"X" position fixing screw
Azimuth adjustment screw
Check the self record-and-playback in the EP mode and SP mode using the tapes T-120 and T-160.
b a c d
c/a ≧ 0.75 } (Models not supporting S-VHS)
b, d/a ≧ 0.63
b, c, d/a ≧ 0.75 (Models supporting S-VHS)
Run the T-160 tape in the various modes of operation. Check that a tape is not damaged at any guides.
Play back the alignment tape TTV-P2L.
Check the maximum output of the video envelope (Ach) is obtained.
Check that the phase difference of the control pulse between the video envelope maximum point and the AFM envelope maximum point, is ±3 ms or less.
Playback mode
Check tape damage at the guide roller.
Return to item (c) and perform adjustment. (Or replace the slider assembly.)
Tape damage at the guide No. 8 brush
Return to item (a) and perform adjustment. (Or replace the pinch lever.)
Tape damage at the guide No. 3 lower flange
Return to item (f) and perform adjustment. (Or replace the pinch lever.)
Frame-by-frame playback mode
Tape damage at the guide No. 8 flange
Return to item (c) and perform adjustment.
REVIEW
Tape damage at the guide No. 8 flange
Return to item (e) or item (a) and perform adjustment. (Replace the pinch lever or No. 9 lever or capstan motor.)
Check tape damage at the guide roller.
Return to item (c) and perform adjustment. (Or replace the slider assembly.)

Fig-2-7-4

3) Adjustment of Tape Run System

<Coarse adjustment>

When the parts/components that are listed in table 2-7-1 are replaced, perform the necessary adjustments referring to the adjustment procedure of the tape run system.

When the parts/components that are listed in table 2-7-1 are replaced, tape running in the tape run system can be affected and the alignment tape can be damaged due to the change of the tape run system. Therefore, run a T-160 tape and confirm that extreme wrinkle does not occur at the respective tape guides before running the alignment tape.

① When a tape wrinkle occurs at the S or T guide roller, adjust the guide rollers so that tape wrinkle does not occur, by rotating the S or T guide roller.

② When a tape wrinkle occurs at the guide No. 8, perform the ACE head tilt adjustment.

Table 2-7-1

The replacement parts that require check and adjustment after their replacement	Adjustment procedure
• Head assembly (cylinder) • S and T slider assemblies • ACE head assembly • Pinch assembly • Guide No. 9 lever	Perform adjustment according to item (a)
• Replacement of the impedance roller • Tension lever • FE head	Perform adjustment according to item (c)
• Clutch gear assembly • S and T reel assemblies	Perform adjustment according to item (d)

[Adjustment procedure]

(a) Coarse adjustment of ACE head

1) ACE head height adjustment

① Play back the pre-recorded SP tape. Check and adjust the audio head core as follows.

② Confirm, and adjust if necessary, the ACE head height so that top edge of the running tape agrees with the top end of the audio head core by rotating the height adjustment screw. (Refer to Fig-2-7-5.)

2) ACE head tilt adjustment

① Play back the pre-recorded T-160 SP tape. Check the tape running conditions at the lower flange of the guide NO. 8 in the playback mode.

② Rotate the ACE head tilt adjustment screw until tape wrinkle is created at the lower flange of the guide No. 8 as shown in Fig-2-7-6 [A].

③ Rotate the ACE head tilt adjustment screw counterclockwise until the tape runs along with the lower flange as shown in Fig-2-7-6 [B].

3) Audio head azimuth adjustment

① Play back the alignment tape TTV-P2.

② Connect the AUDIO output connector to a milli-volt VTVM or to an oscilloscope.

③ Rotate the ACE head azimuth adjustment screw until the audio output is maximum.

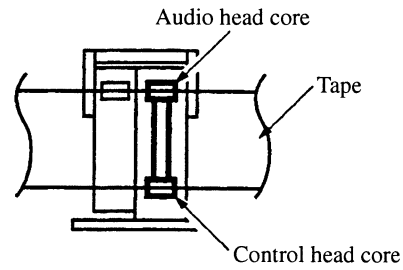


Fig-2-7-5

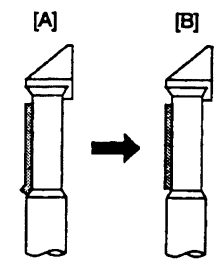


Fig-2-7-6 Coarse check of the guide No. 8

4) ACE head position adjustment ("X" adjustment)

① Play back the alignment tape TTV-P2. Loosen slightly the "X" position fixing screw.

② Insert a flat head (-) screwdriver tip into the X position adjustment slit of the ACE mechanism deck. Adjust the ACE main base so that the envelope output is maximum while the tracking control is set in its center.

(b) Playback phase adjustment

Adjust the playback signal phase according to the Electrical System Adjustment (Servo system).

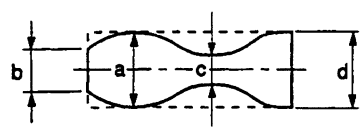
(c) Linearity adjustment

① Play back the alignment tape TTV-P2L.

Note:
- Use the TTV-P2 instead of TTV-P2L when adjusting a VTR that is equipped only with the SP mode. Use the TTV-P2 instead of TTV-P2L in the same way throughout the following procedure when adjusting a VTR that is equipped only with the SP mode..
- Trigger an oscilloscope externally with the switching pulse to display an envelope waveform on an oscilloscope.
- Check that the specifications shown in Fig-2-7-7 are satisfied when the maximum amplitude of an envelope waveform is obtained.
  Play back the alignment tape TTV-P2 and check that the following specifications are satisfied. When the specifications are not satisfied, adjust as follows.

Note:

- "a" is the point where the envelope has the maximum amplitude.
- "b" is the point where the envelope has the minimum amplitude at the entrance of cylinder.
- "c" is the point where the envelope has the minimum amplitude at the center of cylinder.
- "d" is the point where the envelope has the minimum amplitude at the exit of cylinder.



c, b, d/a ≧ 0.75 (Models conforming to S-VHS)

b, d/a ≧ 0.63
c/a ≧ 0.75
} (Models not conforming to S-VHS)

Fig-2-7-7

④ When waveform of the zone "A" that is shown in Fig-2-7-8, does not satisfy the specification, adjust the S guide roller up and/ or down until the specification is satisfied.

⑤ When waveform of the zone "B" that is shown in Fig-2-7-7, does not satisfy the specification, adjust the T guide roller up and/or down until the specification is satisfied.

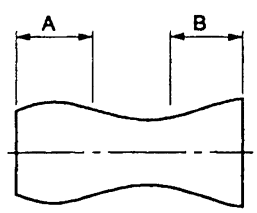


Fig-2-8 Zones of waveform to be adjusted

⑥ When the above adjustments are completed, check that amplitude of the envelope increases and decreases while it maintains the flat shape when the TRACKING UP and DOWN buttons are pressed. Then, play back the alignment tape TTV-P2 and perform the same check as described above using the alignment tape.

⑦ If shape of the envelope changes as shown in Fig-2-7-9, the tape run system has abnormality. Therefore adjust the tape run system again. The smooth curve of second-order shape is permissible.

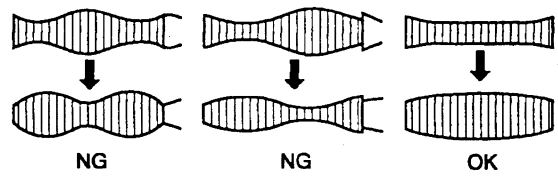


Fig-2-7-9 Abnormal waveform changes

(d) Fine adjustment of ACE head

1) Fine adjustment of audio head core height

① Play back the alignment tape TTV-P1.

② Adjust the audio head height by rotating the head height adjustment screw until the signal envelope becomes flat. (Fig-2-7-10)

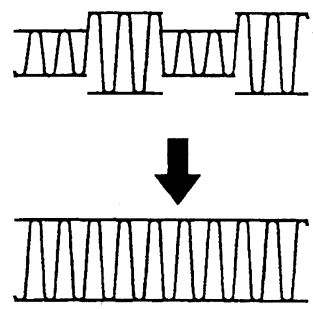


Fig-2-7-10

Note: When the alignment tape in which the audio height adjustment signal of stereo alternating recording, is not available, omit the procedure of step 1) and perform the procedure that is described as (Note) which is described after step 5) in the following paragraph.

2) ACE head tilt adjustment

① Observe the running tape at the lower flange of the guide No. 8. If a tape wrinkle occurs at the lower flange of the guide No. 8, turn the ACE tilt adjustment screw counterclockwise until tape wrinkle is removed.

② When a clearance is found between the lower flange of the guide No. 8 and the lower edge of a tape, turn the ACE tilt adjustment screw clockwise so that the tap runs along with the lower flange.

Note: This adjustment can be easily performed in either SP playback mode, or double-speed playback or CUE mode.

3) Audio head height check
Play back the tape in the same way as step 1) and check that the audio envelope is flat. If the audio envelope is not flat, perform the adjustment as described in step 1) again.

4) Audio head azimuth adjustment
① Play back the alignment tape TTV-P2.
② Adjust the ACE azimuth adjustment screw so that the audio output becomes maximum.

5) Audio head height re-check
① Play back the tape in the same way as step 1) and check that the audio envelope is flat. If the audio envelope is not flat, perform the adjustment as described in step 1) again.

Note:
- When the alignment tape in which the audio height adjustment signal of stereo alternating recording, is not available, use the conventional alignment and adjust the head height.
- Play back the alignment tape TTV-P2L.
- Turn the three height adjustment screws of the ACE head by 45° all in the same direction so that the audio output is maximum.
- Re-check the audio head tilt and azimuth. If necessary, re-adjust them.

6) ACE head position adjustment ("X" adjustment)
① Play back the alignment tape TTV-P2L.
② Press both of the TRACKING UP and DOWN buttons at the same time to reset the tracking to the center value.
③ Trigger an oscilloscope externally with the switching pulse to display an envelope waveform on an oscilloscope.
④ Adjust position of the ACE main base so that the maximum amplitude of envelope is obtained in the same manner as in the "X" position coarse adjustment.
⑤ Play back the alignment tape TTV-P2.
⑥ Check that amplitude of the envelope is maximum with the tracking in the center. When maximum amplitude of the envelope cannot be obtained at the center position of tracking, re-adjust the ACE "X" position so that the maximum amplitude of envelope is obtained in the SP and EP modes with tracking center.
When the maximum amplitude of envelope is obtained in the EP mode with the tracking at center, the error between the tracking position which produces the maximum amplitude of envelope in the SP mode and the pre-set position of tracking center is 3 ms or less.
⑦ Tighten the "X" position fixing screw and fix the ACE mechanism deck.

7) When the ACE head fine adjustment is completed, coat the two screws (tilt and azimuth adjustment screws) in front of the ACE head with Neji-lock (screw locking compound).

(e) Checking the guide lever No. 9
① Insert a T-160 tape (at tape top) and enter the CUE mode. When a sufficient amount of tape is wound onto the T reel table, switch the mode to the REVIEW 3 mode.
② Check the running tape at the top and bottom flanges of the guide No. 8.
Check that the tape runs at the top and bottom flanges of the guide No. 8 without overriding the top and bottom flanges. If a tape overrides either top or bottom flange of the guide No. 8, either pinch lever, or the capstan motor, or the guide lever No. 9 is defective. Replace the defective part.

Note: The adjustment can be performed easier if a T-160 video cassette is modified (i.e., the upper case of a video cassette is removed) for adjustment.

(f) Checking rise-up of an envelope waveform
① Play back the alignment tape TTV-P2L in the REV mode. Observe an envelope on an oscilloscope.
② Change the mode from REV to PLAY. Check to see that an envelope of the entrance side as shown in Fig-2-7-11, rises up within 3 seconds after the mode is switched to the PLAY mode. If an envelope of the entrance side does not rises up within 3 seconds, proceed to step 4., and the subsequent steps for adjustment.
③ Remove the video cassette once. Check to see that an envelope of the entrance side rises up within 3 seconds after a video cassette is inserted and the PLAY mode is entered.

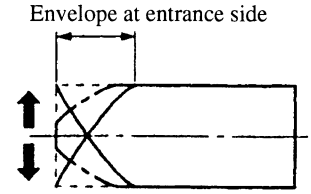


Fig-2-7-11 Rise-up of envelope when mode is switched from REV to PLAY

④ Re-adjust linearity by adjusting the S guide roller.
⑤ Perform steps ② and ③ again to check that the envelope at entrance side rises up within 3 seconds after entering the PLAY mode. If the envelope does not rise up, the S slider assembly or the tension lever may be defective. Make an attempt to replace them.

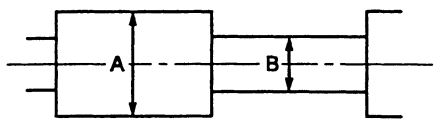
Note: If an envelope does not rise up in the REV mode, it can cause picture noise on monitor in the continuous START-and-STOP repetition recordings.

(g) Checking the envelope waveform

① Make a self record-and-playback using a T-120 tape and a T-160 tape. Check that the envelope waveform satisfies the specifications shown in Fig-2-7-7.

② Make a self record-and-playback using a T-120 tape. Check that the envelope waveform satisfies the specifications shown in Fig-2-7-12.

Note: Check the envelope waveform using both SP and EP tapes.



B/A $\geqq$ 0.55

B $\geqq$ 120 mV

Fig-2-7-12 Envelope output waveform and difference of waveform between the channels

③ If the specifications of the above described steps ① and ② are not satisfied, replace the head assembly (slider).

④ Enter the EP mode at the tape top of a T-120 tape. Check the playback picture that is recorded by the continuous START-and-STOP repetition recordings.

⑤ When noise appears in the playback picture which is recorded by the continuous START-and-STOP repetition recordings, perform item "(f) Checking rise-up of an envelope waveform" again.

(h) Checking tape damage

1) Enter the PLAY mode, CUE mode, REV mode and frame-by-frame playback mode, and check that there is no tape wrinkle at each tape guide in the respective modes using a T-160 tape.

2) When a heavy wrinkle occurs in any of the above described modes, return and perform the respective adjustment items again. Replacement of the parts that are shown in the parentheses, needs to be replaced in some cases.

① Play mode

- Tape damage at the S or T guide roller
  - (c) Linearity adjustment (Slider assembly)
- Tape damage at guide flange No. 8
  - (a) Coarse adjustment of ACE head (Pinch assembly)
- Tape damage at lower flange of guide No. 3
  - (f) Checking rise-up of envelope waveform when mode is switched from the REVIEW mode to the PLAY mode, and from inserting a video cassette up to the envelope waveform rise-up in the PLAY mode. (Tension Lever)

② REV mode

Tape damage at guide No. 8

- (a) Coarse adjustment of ACE head (Pinch assembly, guide lever No. 9, capstan motor assembly)

Tape damage at guide roller

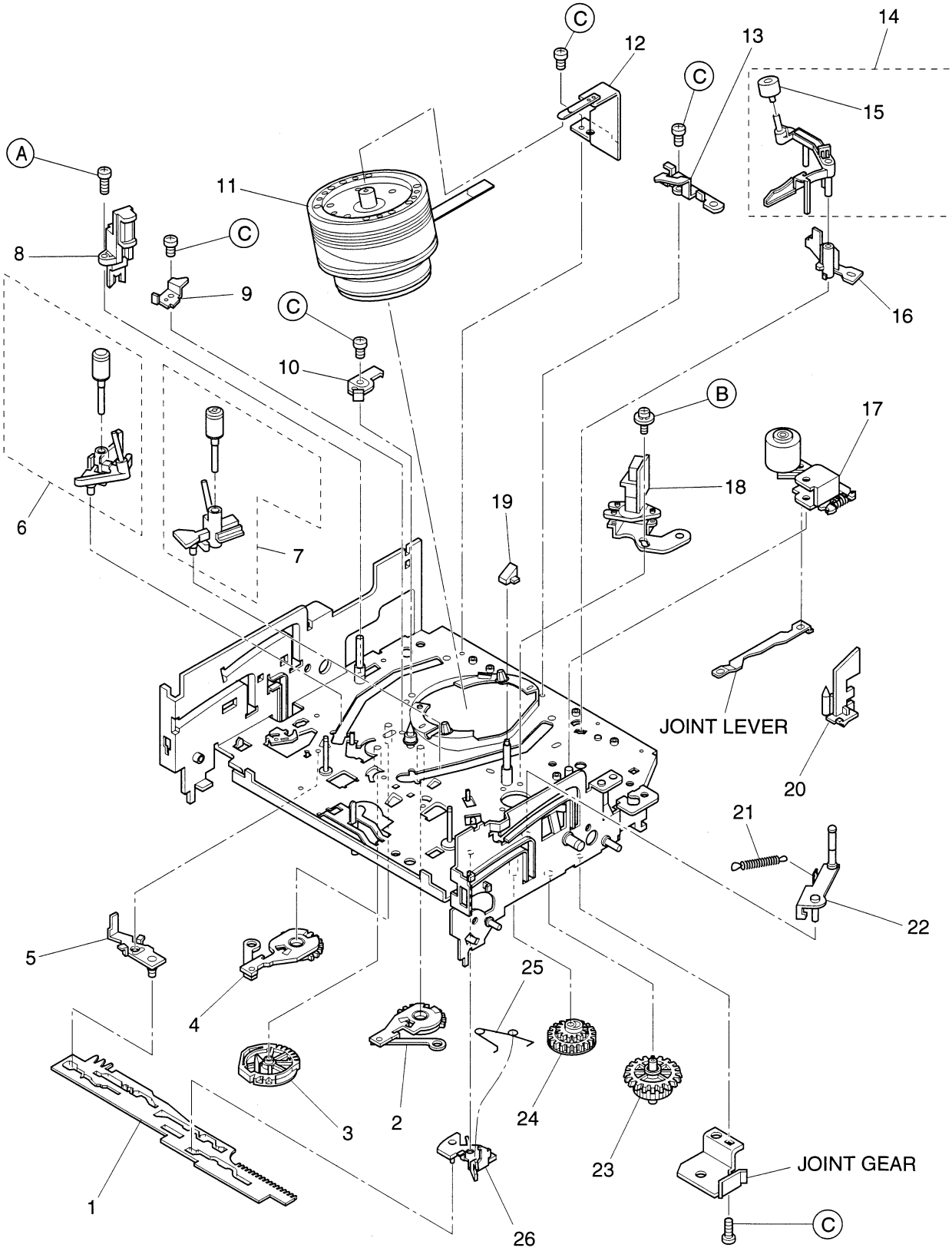
Adjustment of guide roller (Or replacement of the slider assembly)

③ Flame-by-flame playback mode

Wrinkle at guide No. 8

- (c) Linearity adjustment (Pinch assembly, capstan motor assembly)

MECHANISM EXPLODED VIEW 1/2

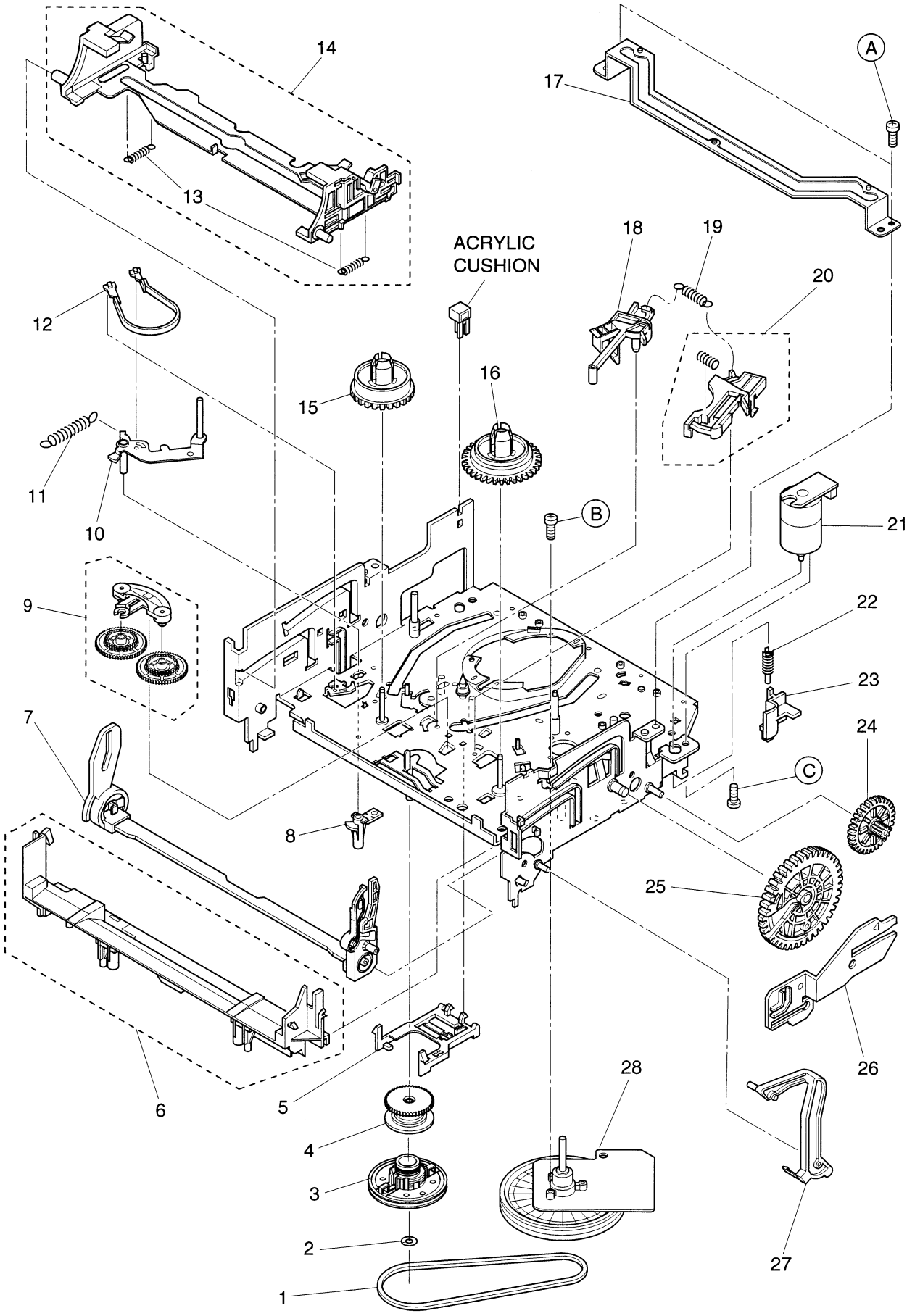


MECHANISM PARTS LIST 1/2

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	S7-037-604-400		SLIDER,CAM
2	S7-032-254-100		LEVER,T.LOAD ASSY
3	S7-033-349-900		GEAR,LOADING DRIVE
4	S7-032-254-000		LEVER,S.LOAD ASSY
5	S7-032-675-100		LEVER,TENSION DR ASSY
6	S7-030-045-500		ASSY,SUPPLY SLIDER
7	S7-032-253-700		SLIDER,TAKE UP ASSY
8	S7-018-302-900		HEAD,FULL ERASE
9	S7-037-346-200		PLATE,CYLINDER B
10	S7-037-347-000		PLATE,CYLINDER C
11	S7-031-195-700		CYLINDER,ASSY(BLOCK)
12	S7-032-587-300		GROUND,BRUSH ASSY(NEW-V)
13	S7-037-346-100		PLATE,CYLINDER A
14	S7-032-675-400		LEVER,HEAD CLEANER ASSY
15	S7-032-671-500		SUB AS(ROL.CLEANER)
16	S7-084-295-200		SLEEVE,HEAD CLEANER
17	S7-032-675-600		PINCH,ASSY
18	S7-031-879-300		HEAD,ACE ASS'Y
19	S7-036-828-300		CAP,8 GUIDE
20	S7-036-168-800		GUIDE,CASSETTE.DOOR
21	S7-035-641-600		SPRING,9 GUIDE
22	S7-032-674-500		LEVER,9 GUIDE ASSY
23	S7-036-827-900		GEAR,JOINT 1
24	S7-036-829-100		GEAR,JOINT 2
25	S7-035-642-600		SPRING,PINCH DRIVE
26	S7-032-676-400		LEVER,PINCH DR ASSY
A	87-251-074-410		SCREW,PTTS 2.6X8 SZN
B	S7-039-193-600		SCREW,PTTS 2.6X5.6+SW+2W
C	87-251-072-410		SCREW,PTTS 2.6X5 SZN

MECHANISM EXPLODED VIEW 2/2



MECHANISM PARTS LIST 2/2

DESCRIPTIONで判断できない物は "REFERENCE NAME LIST" を参照してください。
If can't understand for Description please kindly refer to "REFERENCE NAME LIST".

REF. NO	PART NO.	KANRI NO.	DESCRIPTION
1	S7-034-211-700		BELT,PULLEY
2	S7-039-619-100		LUMIRR0R 2.1X 5X0.5 (RED)
3	S7-031-610-900		HOLDER,CLUTCH ASSY
4	S7-031-611-000		GEAR,CENTER ASSY
5	S7-032-676-700		LEVER,UP DOWN ASSY
6	S7-036-172-000		GUIDE,FL.CASSETTE(VCP)
7	S7-032-490-300		LEVER,FL ARM ASSY
8	S7-037-982-400		SLEEVE,TENSION
9	S7-031-611-100		LEVER,IDLE ASSY
10	S7-032-674-800		LEVER,TENSION ASSY
11	S7-035-643-600		SPRING,TENSION LEVER
12	S7-032-675-300		BAND,BRAKE ASSY
13	S7-035-639-400		SPRING,FL.LEVER-LR
14	S7-032-490-200		HOLDER,FL.CAS ASSY
15	S7-033-160-300		DISK,S.REEL
16	S7-033-160-400		DISK,T.REEL
17	S7-037-208-900		BRACKET,FL.TOP
18	S7-032-676-500		LEVER,S.BRAKE ASSY
19	S7-035-642-800		SPRING,BRAKE
20	S7-032-676-600		LEVER,T.BRAKE ASSY
21	S7-032-254-200		MOTOR,LOADING ASSY
22	S7-033-349-800		GEAR,WORM
23	S7-036-168-700		HOLDER,WORM
24	S7-033-349-700		GEAR,WORM WHEEL
25	S7-033-350-600		GEAR,FL.CAM
26	S7-037-604-600		SLIDER,FL.DRIVE
27	S7-036-349-100		LEVER,FL.DOOR
28	S7-012-577-400		MOTOR,CAPSTAN ASSY
A	87-251-072-410		SCREW,PTTS 2.6X5 SZN
B	87-261-073-410		PTTB 2.6X6 SZN
C	87-251-091-410		PP 3X3 SZN